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[Founded in 1849 as the "Journal of Gas Lighting."]

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EDITOR & PUBLISHER: WALTER KING. OFFICE: 11, BOLT COURT, FLEET ST., LONDON, E.C. 4.

VOL. CXLVIII., No. 2953.] TUESDAY, DECEMBER 16, 1919. [71ST YEAR.

EDITORIAL NOTES.

Coal Price Reduction and the Sliding-Scale.

THE reconstituted National Gas Council has held its first annual meeting, under circumstances which are unprecedented in the history of the gas industry. The year has been full to overflowing with changes in condition which have added to the complexity and trouble already present in the conduct of the business of gas undertakings; and it has also been a year in which we have entered upon the initial work associated with the prospective revision of the statutes relating to the operations, obligations, and financial reward of the industry. It has therefore been a year teeming with exceptionally heavy work for the industry's representative organization. Developments in the situation have succeeded one another with almost lightning rapidity; and there are not wanting signs that the next few years will make serious claims upon the Central Executive Board of the Council. What would have been the result of the year's events for the industry without the strength that the Council in its reorganized form could put forth to protect and to negotiate, we dare not contemplate. Fortunately, there is no necessity to do so; for vigilance and activity have been great—far greater than the summary of final result or position even indicates. Those who read the annual report and the speech of the President (Mr. D. Milne Watson) at the meeting cannot fail to appreciate the responsibility that the Central Executive Board have voluntarily incurred. For this reason, combined with the critical times through which we are passing, it is hoped that the undertakings representing the balance of gas supply not included in the membership of the Council will, by changing their status in this regard, do their share in supporting the work for the industry.

The annual report and the President's speech treat of several matters; but of outstanding immediate importance is the bearing of the 10s. per ton reduction in the price of the part of the coal carbonized that produces gas sold for domestic purposes. The reduction in the price of coal for domestic use, while it is maintained for industrial use, introduces into coal trading a mode of procedure altogether new, and one highly questionable from the economic standpoint. However, there it is, and the gas industry has to face it. While the division between industrial and domestic uses of coal increases the work and difficulties of coal trading, there is not an industry into which the division has introduced so many complications as it has in the gas industry, owing to the variety of conditions which exist in it—the variety of the processes of making gas (including water gas), the variations in the gas-producing qualities of coals, the compulsory reduction in the price of coke, the varying market values of coke and other secondary products, and the difference in the value of coal stocks purchased at high prices and the reduced cost of current deliveries—which defy any hope that may have been entertained outside the industry as to the 10s. reduction enabling a universal level drop to be made to householders in the price of gas. We cannot understand how, under the current condition, such a stupid notion got abroad as that the 10s. reduction in the price of coal would enable a 10d. reduction to be made in the charge for domestic gas. Individual conditions must govern; and the President and the Central Executive Board of the Council have been busy with the Coal Controller (Mr. Andrew Rae Duncan) to show him the impossibity of announcing any universal level reduction in the price of household gas. The President has a wide experience of the heads of Government Departments; and it therefore means something when he says that Mr. Duncan is the most sympathetic head of such a department with whom he has come into contact. We are glad of this, because in coal control the industry has a very large concern; and so it matters greatly to it who is the man at the top. At any rate, a man of affairs such as Mr. Duncan will understand, now that they have been put before him, the obstacles that there are to uniformity in gas reduction, though there is uniformity in the coal price reduction.

There is the point as to the effect of this reduction upon the sliding-scale of gas prices and dividend. The effect, so far as we can see, concerns far more the industry's future than the present. In the case of those gas companies that have had to take refuge under the Statutory Undertakings (Temporary Increase of Charges) Act, the operation of the sliding-scale has come to a temporary end; but the President (as we understand him) appears to be of the opinion that the reduction of 10s. applying only to the coal used for producing gas for domestic purposes has absolutely ended the sliding-scale in its application to gas undertakings. We should not go so far as that, though we do agree that it would have been better for the country generally and for the gas industry in particular had there been no distinction made between industrial and household coal and gas, but a smaller reduction effected in coal prices all round. This might have allowed those concerns that are still under the rule of the sliding-scale to have paid a slightly better dividend, and have lifted some undertakings from continuing under the protection of the Temporary Increase of Charges Act, and enabled them also to pay a little more dividend. But there are gas undertakings that have the right to charge differential prices and to make discounts for industrial gas, and we should imagine that in most of these cases the price of industrial gas will still be lower than the reduced price of domestic gas. In these circumstances it appears to us that, if the ordinary price of gas is brought below the standard price, the sliding-scale would automatically come into operation again. If there is any legal impediment to this, it has not occurred to us, or it has escaped our notice, and we should be glad to hear of it. In this connection, however, it will be seen that the President states that an assurance has been given to the Coal Controller to the effect that the industry is perfectly willing to pass on to the gas consumer "every penny saved;" and he appeals to gas undertakings to deal fairly and squarely with the reduction of price, and to see that the domestic consumer gets "the whole of the benefit." Does this mean that no share of the benefit arising from the reduction is to go in the shape of dividend under the sliding-scale where the conditions fortunately happen to be such as to admit of a little extra payment?

As previously said, the effect of the reduction upon the sliding-scale will, so far as we can see, concern the future more perhaps even than the present. In association with the new legislation that is to be applied to the gas industry, there has been a suggestion that the standard price of gas should be subject to variations in the price of coal. If this should stand in the revised conditions, then very great care will have to be exercised in giving it proper and adequate form, because if there are to be repetitions of the present action of the Government in reducing the price of only part of the coal the industry uses, the basis of the sliding-scale (as it now exists) would be rendered defective to the point of vitiating its whole operation. This is a matter that has to be faced; and there is the assurance of the President that it will be faced. Whatever suggestion has been made in this connection will now have to be reconsidered, and

provision made for protection against a recurrence of the present or similar action. There must not be allowed to remain any loophole that can be discovered for a repetition of such damage to the credit of the gas industry as has occurred during the past five years.

The Electricity Supply Bill.

THE second reading of the Electricity Supply Bill was agreed to without a division in the House of Lords yesterday week; and the Committee stage, it is expected, will commence to-day, when doubtless some attempt will be made to effect amendments. The second reading went through despite the fact that the whole of the speeches, with the exceptions of one by Lord Haldane and one by the Lord Chancellor, were opposed to the measure in respect of policy, of the tendencies of the proposals, and of finance. The Lord Chancellor bewailed the fact that his ears had not, with the exception of the speech by Lord Haldane, been gratified by one genuine or warm word of friendship for the Bill. This is not surprising, when the Government present to the Legislature a measure adumbrating a scheme built up by nothing better than vagueness, with a bonding of hypothesis to try to make it look something substantial. Lord Haldane and the Lord Chancellor, as become two clever lawyers, did their best to make the scheme appear to be of real value. They could not do it from their own knowledge, but simply relied on what they had been told, and what had appeared in reports. There has rarely we should imagine been a scheme presented to Parliament dealing with a technical matter of this kind that has had such an array of technical opinion against it. The Lord Chancellor said "the best" electrical brains have been working on the scheme; but his Lordship might have been reminded that the majority of the best of electrical brains were not upon the Advising Committees, and in that majority there is a very general and genuine objection to many features of the Bill.

We are told now that the object of the scheme is to greatly increase the production of electrical power. The object was not always so limited. But that is a point to which there will be reference presently; and then it will be seen that some of the old illusion and chimera still survive—at all events, in the mind of Lord Haldane. In making the estimates which have had such an overwhelming effect upon the Government, the Lord Chancellor, and Lord Haldane, one of the mistakes that has been made has been to take the whole of the coal used in industry as being consumed for the purpose of power. The impressive figure of 80 million tons was rolled-out by Lord Haldane as being the amount of coal now expended for power; and to say (as he did) that rather less than one-third of this coal would by the electrical way supply all the power required in this country is to say something that is distinguished by both rashness and ignorance. A large amount of the coal is used in industry for heating purposes and the raising of steam; and in many cases where steam is required for other purposes, it pays well to generate electrical energy for power on the spot. It is clear that Mr. C. H. Merz and those who had the principal hand in painting their reports in such vivid colours have completely turned the heads of the Government, Lord Haldane, and others. Lord Haldane has been highly impressed by Mr. Merz, who was a member of the Coal Conservation Committee over which his Lordship presided. He is an "eminent authority on the electrical side "who has made a great success in practice in the organiza-"tions which have been created under his auspices in the "North-Eastern Counties of England." We would not derogate by one jot the eminence and authority of Mr. Merz; but Lord Haldane should be told that the conditions existing on the North-East Coast were peculiarly advantageous for the exercise of the talents of Mr. Merz, and the conditions have contributed as much to the success there as, if not more than, the talents of the individual. If any electrical engineer could not have made a success of the conditions flourishing there, he would not have been worthy of the professional title. What Mr. Merz has done there could not be reproduced under other conditions elsewhere. Then the estimates as to the saving of coal are based upon an expenditure of 1½ lbs. per indicated horse-power. To apply this figure universally to the conditions existing in all other parts of the country is folly, as other men with highly cultured electrical brains will agree. These are among the uncertain bases of the electrical estimates which the Government wave so persistently before the Legislature and the public in order to make this electrical venture acceptable. For what purpose? "To increase industrial production," chant those who are fathering the Bill. Power, however, represents only a small percentage in the costs of production. What manufacturers want is cheaper materials upon which to work, and fairly compensated labour willing to co-operate in increasing production. When they get these conditions, manufacturers will see right enough that they obtain all they require in the way of power. The Government in this matter of industrial production have, but they do not realize it, taken hold of the thin end of the stick.

With regard to finance, there has been much criticism in the House of Lords. The Government are committing themselves to find for the inaugural stages of the scheme and for loans 45 millions sterling, which is to be repaid. Once the Government enter upon such assistance to an industry, the maintaining of their security will probably necessitate further financial aid. Lord Haldane admits that the 45 millions might have to be exceeded; but he submits that this is a question for Parliament hereafter. In the present condition of things, the country would prefer that the Government refrained from any more financial engagements than are absolutely essential, or which have a certainty of good result attaching to them. The Lord Chancellor was inclined to ridicule those who had put forward the idea that 150 to 200 millions of money would be needed to carry through the scheme. There is more justification for such figures than for the estimates as to requirements which led the Government to fix upon the 20 and 25 millions in their Bill. The Coal Conservation Power Sub-Committee's report is dated April 17, 1917. The distinction between then and now in the prices of material and labour is a vast one; and the reorganization and new construction are going to come under the new costs. The scheme itself is of such a far-reaching order that no exact computations can be made; but if ever it is completed, the capital cost will not be a light one. The gas industry can—whether the matter be regarded from the point of view of finance, or that of savings measured by money or tons—we think safely leave this Bill without much further comment; for the feeling is pretty general that it provides for one of the biggest home hazards in which the present Government have ever engaged.

The Gas Industry and the Bill.

THE gas industry appears to be receiving a great deal of unmerited blame for the opposition to the Bill; while, as a matter of fact, the industry has had little to do with it, other than (before the Bill was introduced) to show, from the coal conservation standpoint, the worthlessness of the savings estimates that had been made, and to put the position of the gas industry correctly before members of Parliament and the public. If it is coal conservation the Government are after, then the gas industry can show a better way to that end than the electrical industry. Yet the country months ago heard much of the influence, in the speeches of politicians, of the hyperbole that appeared in the report of the Electric Power Sub-Committee of the Coal Conservation Committee, and which influence has still possession of Lord Haldane's mind. This is seen when he says: "Unless the consumer "is able to get motive power for his works, and light and "heat for his house, on a reasonable scale;" and, again: "If 'heat' could be furnished by electricity not merely for "power, but for domestic use." These quotations are clear testimony to the fact that his Lordship's mind is absolutely vacant regarding the subject of the relative thermal efficiencies of gas and electricity production. Lord Emmott endeavoured to remedy the deficiency when he showed that, by utilizing electricity for heating purposes, the consumption of coal would be increased and not diminished. Lord Haldane may be safely recommended to a course of study of the report on the subject by Sir Dugald Clerk and Professors Smithells and Cobb, and then he will understand that his Committee's report was not the last word regarding coal conservation. It was the exuberance of politicians in speaking of coal saving and heat provision by electricity going together that induced the gas industry to enter upon an exposure of the nonsense that was being promulgated throughout the country. But the gas industry has taken no part in the discussion in opposition to the Bill. All it has asked in the way of amendment has been to ensure, in section 2 of clause 15, that the District Boards or Joint Local Authorities have not the power to compete with gas

undertakings with the gaseous form of energy to supply which gas undertakings have had statutory powers conferred upon them. The gas industry is not—and quite naturally—keen to see a competing industry given preferential State aid either in finance or facilities; but its main interest in the measure now is as part of the body politic, in which capacity it is concerned, but has taken no active part in the opposition, in the matters of policy and finance. The opinions to which Lord Moulton gave expression in the House of Lords are due to his own convictions arising from a knowledge of these questions far in excess of anything that either Lord Haldane or the Lord Chancellor possesses. That Lord Moulton's views harmonize with those of the professional men of the gas industry is fortunate, and that they harmonize with those of so many men in the electrical industry is a satisfaction, because it shows that opinions have a larger base than self-interest.

We cannot get away from Lord Haldane in these comments; and there is one more point which ought not to be passed over. He stated that "one of the reproaches against "the Bill is that it does not take account of the gas indus- "try. It is a great mistake. Nobody desires to hurt that "industry; nor does anybody think that the principle of "the Bill, even if carried into operation, would injure the "gas industry." The Bill does not take account of the gas industry. If it did, it would have been seen whether the two industries could have co-operated in serving coal conservation. His Lordship mentioned that with great electric super-stations it is possible to erect works for obtaining bye-products in a very different fashion from that which obtains to-day. We do not know just what is meant by a "different fashion." Of course, the possibility of erection is there; but the economy of it is quite another matter. If coal is carbonized, it means that the coke would be used for boiler-firing, and probably some of the gas in gas-engines. Gas-works already carbonize coal, and can supply the coke needs of electricity stations just as freely as putting up special plants. And the question is coal conservation. But the attraction is pit-head carbonization. Pit-heads are not famous for a sufficiency of water supply for condensation purposes; so that power stations could not generally be put immediately where the coal is produced. The secondary products would still have to be distributed about the country. If part of the coke had to be sent away, this would be a contra to the saving in the carriage of coal, and carriage would be required for the other products. Further, nobody knows the future of the products market; and over-production is not a desirable thing. It is fortunate that the Board of Fuel Research are to make close investigation of this matter before any determination is arrived at to create something preceding electricity generation, but joined thereto, which may prove to be a "white elephant," and a source of additional cost and loss to electricity consumers. "Gas," his Lordship informed the House, "is "produced in a costly fashion at the moment." So is electricity. But neither the gas nor the electricity industries can help the present costs of materials and labour. We should like Lord Haldane to show the gas industry a better road than that (about which he apparently does not know much, if anything) which it is travelling towards a greater economy. The gas industry is indisputably the one that uses coal in the most efficient manner. What is abundantly plain from the discussion in the House of Lords is that Lord Haldane got absolutely out of his depth in assisting to save the Electricity Bill.

Coal Profits Limitation.

BETWEEN opposing currents, the Government are in a quandary over the Coal Industry Bill, which proposes the limitation of the profits of the mine-owners for a year to 1s. 2d. per ton of coal raised and sold, exclusive of the profits made on coke and chemical products, brick making, and wagon hire, with allowances, in addition, for new capital, for debentures, and for amortization, which put a somewhat different complexion on the 1s. 2d. Nobody in the House approves of the Bill. The Government do not like it; and the House, having in its constitution such a large representation of industry, is strongly opposed to the principle of the limitation of profits. Nevertheless, it is probable the Government would have carried the Bill through on the understanding that it was merely an emergency measure, and would not be repeated or used as a precedent, had it not been that the Labour Party, with the miners' representatives, provided a surprise which it was clear would have heaped more trouble on the head of the Government, and upon an already much-vexed country. The Bill is purely for the fulfilment of the pledge the Government were forced into giving by the Miners' Federation. It was a blind undertaking, as has now been proved. It was a pledge to adopt the first report of Mr. Justice Sankey's Committee dealing with hours and wages; and this contained the recommendation as to the 1s. 2d. limitation of profits. The Labour Party are distinctly in favour of the limitation of profits, but not of the limitation of the time of operation. They therefore wanted a clear pronouncement from the Government (which the Government were not prepared to give) as to the policy that would follow the temporary measure. The Government, however, appear to have given another pledge to the opponents of the measure, and this to the effect that what is now proposed shall have only temporary existence; so that the problem of the Government is how to save themselves from disaster between these opposing currents. The Miners' Federation have further ground of opposition; and it is that the Bill contains a clause relating to the termination of the coal mines control agreement from March 31 next. The miners' view is that the sudden removal of control would make the position at the mines more chaotic than it is now. It is a very difficult position for the Government; but they have largely brought it on themselves by avoiding one difficulty by the creation of another.

Regarding the general question of the limitation of profits in industry, it is a matter that requires handling very delicately and discreetly. The part of the gas industry run by private enterprise has for a long period been working under a limitation of profits; and the profits are limited severely just now, to the injury of the credit of the industry, which has brought the flow of new capital into it down to a state of sluggishness, which is very harmful. In pre-war circumstances, the limitation of profits *plus* (in the case of the sliding-scale companies) the additional reward obtained in consideration of price reductions to consumers worked very well. But the limitation of gas profits is a percentage upon capital, and not a flat-rate upon production or sales, as is proposed in the case of the coal industry. From every point of view—particularly from that of equity—the flat-rate on production is fundamentally wrong; seeing that the relation of capital to production varies largely in different collieries, just as the capital employed in gas supply in different towns varies with the local conditions. Some mines are rich and some are poor; and the ratio of capital to production is considerably to the disadvantage of the latter. It is just the same in the gas industry. Moreover market prices must vary with the quality of the coal. Limitation of profits applied to all industries, unless based upon the capital employed, and then accompanied by an incentive to work for reductions of price to the consumers, would be disastrous to the flow of new capital, and thus to development, as well as to economical management, which would impose its results upon the consumers. This is a danger that the leaders of industry and the financial world see in the form of precedent that the Government were proposing to apply to the coal industry, and applied on a wholly wrong basis. Such a course of action would be fatal to industries—not only in respect of capital, but to initiative and perseverance, and to all private enterprise in a small way.

The upshot of the discussion so far as it went was that the Bill was withdrawn for the time being. But what is going to happen is not known. The Government is in an ugly position; and there is little hope of an escape from it during the remnant of this session. Why do they not try the effect of a triple alliance between owners, miners, and consumers, in the shape of a co-partnership scheme, with a limitation of profits on capital, and additional reward to both owners and miners based on the average price to the consumers of coal drawn from each colliery or group of collieries under one ownership? The same suggestion has often been made; but there has been no practical attempt at application. Perhaps the miners who believe in unlimited wages for much restricted hours of work, but a strict limitation of profits, are the barrier in the way to a reform which would redound to the advantage of all interests concerned. The chief consumers of British coal are the nation; and the miners profess a desire to serve the nation. But it must be in their own unbeneficial way; and the degree of the service must be governed by their will, and that of nobody else. It is all a curious mess, which will take some clearing up.

No Compensation for Coal Stocks.

If there are any gas men who thought the Government might treat them the same as coal merchants, and make an allowance on coal stocks bought at high prices before the 10s. drop in the price of domestic coal, in order that the householder might get the benefit of a reduction in the price of gas as early and as large as possible, they will be disappointed. Sir Auckland Geddes states that he does not think it practicable to pay compensation to gas and electricity undertakings in respect of stocks purchased before the 10s. per ton reduction was made. Perhaps it is as well. Compensation might carry with it some voice in determining the amount by which the price of gas should be reduced; and this would be more impracticable, in view of the galaxy of factors that must be taken into account, than the fixing of the amount that would be required to compensate the difference between the old and the new prices of coal. Those concerns that did not make an advance in the price of gas last quarter, but were contemplating doing so next quarter, will in most cases only be able to make a slender concession in response to the 10s. reduction. It will be difficult to get consumers to understand this when they come to compare the reduction with the price decreases of neighbouring undertakings; and if the point be made that the undertaking was not under the necessity three months since of raising the price of gas, notwithstanding the 6s. advance in the cost of coal, the consumers may come to the conclusion that they were paying a bit more for gas before the 6s. coal advance than there was any necessity for. It is a glorious muddle.

No More Lightning Railway Strikes.

This seems too good to be true; but there appears to be an earnest resolve (without giving up the strike weapon completely) on the part of the Ministry of Transport and the National Union of Railwaymen and the Associated Society of Locomotive Engineers and Firemen, to do something effective to prevent them. The gas industry, with its large dependence upon railway traffic, will wish the efforts a magnificent success. It is not long since that the country had something in the nature of a lightning strike brought about by the first-named Union; but the Union, being one of the parties to the creation of machinery to prevent repetitions, may have found that the effects of a lightning strike are not likely to be exactly the same to-day as they were before transport by road assisted in enabling the community to hold out, and not be held up impotent. New conditions and a public will strengthened by resentment against the inordinate lengths to which some of the trade unions have been going have altered the easy walk-over expectations of the union leaders. They are wise in this, as well as in turning to see whether there are not available other means by which they can, in a far more dignified way, realize fair claims. So new machinery is to be established for the settlement (other than the matters now under negotiation) of wages and conditions of service during the period of the present control of the railways under the Ministry of Transport Act. A Central Board is to be set up, consisting of five railway managers and five representatives of trade unions, with power to each side to add a sixth member. Failing agreement by the Central Board on any matter, it will be referred to a National Wages Board, consisting of four railway managers, four railway workers, or their representatives, and four users of the railways. The two Unions concerned have agreed that no strike shall take place on account of a dispute arising on these matters until one month after the question in dispute has been referred to the National Wages Board. Local Committees are to be set up; and an Advisory Committee has already been formed. The scheme looks good and feasible; and no one, other than enemies of the country, will wish it anything but the fullest success.

Higher Goods Rates.

Against the satisfactory subject of the previous paragraph has to be set an indication that railway rates are on the up-grade for the carriage of goods. Recognized as unavoidable, this change has been expected; but there will not be cordial welcome in the gas industry. Sir Eric Geddes told a deputation of members of Parliament last Wednesday that there was a great deal of traffic coming now by rail which previously went by sea; and this was due to the fictitiously low railway rates. He anticipates that as soon as he can get the rates up, the situation will be easier in many ways. Sir Eric also declares that it does not pay shipowners, even with the limited subsidy that is being given to help coastal traffic, to compete with railway rates. The subsidy is to come off as soon as railway rates are placed on an economic basis; and he hopes this will be before Jan. 15.

The Wagon Position.

As a lot of our transport troubles are due to the wagon position, it is satisfactory to learn from Sir Eric Geddes that there is some improvement. At the present time, the United Kingdom owns 1000 more wagons than it did in 1914; but in Great Britain alone the actual available rolling stock (700,000 in 1914) is 5 p.ct. down, which means 35,000. There are still between 15,000 and 18,000 wagons in France belonging to British railways, and another 15,000 to 18,000 awaiting repair. So that we have roughly about 35,000 wagons not in use. The wagons in France are coming back at the rate of 600 a week; but the Secretary of State for War has plans in hand for getting the number up to 900.

Coke-Oven Gas.

The amendment which was secured by the gas industry in sub-section 2 of clause 15 of the Electricity Supply Bill was noticed in our columns on the 2nd inst. The National Gas Council were the movers in this matter; and when the President (Mr. D. Milne Watson) referred to it at the annual meeting last week, there was evidence of good satisfaction. The first gain from the amendment is that the District Boards or Joint Authorities are prohibited from supplying any form of energy other than electricity without the consent of the authorized distributors. It is quite possible that, as time goes on, the generating bodies will have surplus gas for disposal. The super-stations may ultimately carbonize their coal, though at present it is regarded as a speculative side to the business that had better be left alone until, at any rate, the Board of Fuel Research has had an opportunity of investigating the matter and advising upon it. The President of the Council points out that, should this be a prospective development, the controlling authorities will not now be able to enter the market with gas in competition with gas undertakings, and would be compelled, in the first instance, to offer surplus gas to gas undertakings in order that they might deal with it. This, he regards, and properly so, as a valuable concession to the gas industry. It is; but it applies to a long distance ahead. Before it can come about, the district electricity generators may be casting round to see where coke-ovens already exist, and open-up negotiations for obtaining possession of the gas production. Gas undertakings in the industrial districts should make a survey of the coke-oven plants, to ascertain whether there is satisfactory business to be done. They can put the gas to better use than the electricity generators, and so should have first call upon it. In the Swinton and Mexborough Gas Board Act this year, power was given to the Board to go outside the gas-supply area to tap a source of coke-oven gas, although the gas suppliers in whose area the coke-ovens are situated opposed. But there is enough coke-oven gas produced to give both a supply. The decision is worth keeping in mind.

Unemployment Insurance.

The Prime Minister states that a Bill is being prepared, and will be introduced into Parliament at an early date, to extend the principle of unemployment insurance to trades other than those already insured. It is stated that the Minister of Labour will be anxious to consult the trade organizations and trade unions concerned. Perhaps the matter is one into which the Federation of Gas Employers should look to ascertain whether the interests of the gas industry will be in any way affected.

The second meeting of the session of the Coke-Oven Managers' Association, Midland Section, will take place on Saturday next at the Grand Hotel, Sheffield. Mr. Thos. B. Smith, of Stocksbridge, will read a paper entitled "Some Technical Problems of the Future."

There is to be a special general meeting of the Yorkshire Junior Gas Association next Saturday, at the Gas Show-Rooms, Darley Street, Bradford. Among the important subjects for discussion are: (*a*) The financial position of the Association. (*b*) The National Association of Technical Gas Officials. (*c*) The Education scheme. A proposal will be submitted to make the subscription 12s. 6d. per annum to each member on attaining the age of 21, and under this age 10s. a year.

PERSONAL.

STAFF CHANGES AT BIRMINGHAM.

Unhappily, the condition of Mr. Walter Chaney's health has compelled him to ask the Birmingham Corporation Gas Committee to retire from the position of Engineer of the Saltley works, under the provisions of the superannuation scheme. This has created a vacancy in the Engineering Staff, which has resulted in the following appointments: Mr. T. H. Hack to be Engineer at Saltley; Mr. G. C. Pearson to be Engineer at Windsor Street; Mr. R. A. S. Browning to be Engineer at Swan Village; Mr. G. A. Bamber to be Engineer at Adderley Street. Mr. E. B. Tomlinson, Engineer at Nechells, is unaffected by the changes. Mr. J. Foster, whose appointment as Engineer-in-Chief has already been notified, will in future make his headquarters at Saltley.

We are very sorry to learn that, having, since his breakdown in health, been unable to continue, even in a modified form, his heavy responsibility as Engineer to the Wandsworth, Wimbledon, and Epsom District Gas Company, Mr. H. O. CARR has been allowed by the Board to retire in order to recuperate. His Chief Assistant, Mr. CYRIL M. CROFT, has been appointed Engineer to the Company. It is to be hoped that, with rest, Mr. Carr may be speedily restored to health.

Mr. W. A. WHITE, Assistant Manager in the Dawsholm Works of the Glasgow Corporation Gas Department, has been appointed Superintendent of the Neepsend Works of the Sheffield Gas Company, at a salary of £500 per annum, with free house, rates, &c. Mr. White served his apprenticeship in the workshops and drawing office of the late Messrs. Hanna, Donald, and Wilson, Gas Engineers and Contractors, of Paisley; and also with Messrs. R. & G. Hislop, Consulting Gas Engineers. Thereafter he was two years with the Kilmarnock Gas Department and the Falkirk Gas Department respectively. He next went to Callao, Peru, as Engineer and Manager to the Callao Gas Company, where he remained for a period of about eight years. On his return to Glasgow, he entered the service of the General Manager in the Engineer's office of the Glasgow Corporation Gas Department. In this capacity he had the personal supervision of the erection at the Dalmarnock works of a duplicate installation of "Wilson" vertical retorts, 2½ million cubic feet per day.

The Home Secretary has appointed Mr. WILLIAM WALKER, C.B.E., to be Chief Inspector of Mines, in place of Sir RICHARD REDMAYNE, K.C.B., now Chairman of the Imperial Mineral Resources Bureau. Mr. Walker has been acting as Chief Inspector of Mines for the past three years, while Sir Richard held the post of Chief Technical Adviser to the Controller of Coal Mines.

Mr. A. C. WHITNEY, who has been with the Stretford Gas Company, has been appointed Technical Assistant and Chemist at the Ash Road manufacturing station of the Aldershot Gas, Water, and District Lighting Company.

Mr. GEORGE H. ELLIOTT, Superintendent of the new Hilsea Station of the Portsea Island Gas Company, who, previous to May last, was for 3½ years Superintendent of the Flathouse Station of the Company, has been appointed District Engineer to a large oil undertaking. Mr. Elliott takes up his duties in the oil industry on Jan. 1.

The staff of the Cork Gas-Works made a handsome presentation to Mr. W. BUCKLEY, the Assistant Manager, on his appointment as Manager of Tralee Gas-Works.

Mr. EDWARD GARSED, of the Elland Gas Company, who is to leave for India after Christmas, to take up an appointment with the Oriental Gas Company, at Calcutta, was presented last week with a gold signet ring by the staff and employees. Mrs. Garsed was handed an aquamarine pendant and chain.

Consequent upon the necessity for an operation, Mr. JOHN W LEE, of Chesterfield, who is President of the Coke-Oven Managers Association, will be in a nursing home for the next few weeks.

OBITUARY.

WILLIAM GADD.

OF all the work done by Mr. William Gadd, of Manchester, in his long life, the most important, so far as the gas industry is concerned, was in connection with the construction of holders, though, as a matter of fact, he was a pioneer in more than one subject of science. His labour is now ended, for he died of broncho-pneumonia on the 27th ult. He was in his 82nd year, and retained his intellectual brightness to the last.

Turning back to the numbers of the "JOURNAL" published between twenty and thirty years ago, frequent mention is found of Mr. Gadd's name. It was in consequence of his friendship with Mr. Thomas Newbigging that his attention became particularly drawn to the gas industry; and he came in contact with many members of the profession at the Manchester meeting of the Gas Institute in 1885, when Mr. Newbigging was President. Mr. Gadd then read a paper entitled the "Effects of Heating Air upon Combustion;" this following a series of articles contributed by him to the "JOURNAL" upon the subject of heating air in regenerator furnaces. The articles referred to were the outcome of an investigation which was first suggested to him by Mr. Newbigging in consequence of a controversy started by Mr. W. A. Valon at the previous year's meeting of the Institute.

Next came Mr. Gadd's work in connection with gasholder construction, which he began by theoretically showing the possibility of dispensing entirely with external guide-framing of gasholders, while still retaining conditions of stability. From that time dates the history of the spiral-guided holder. In 1888 Mr. Newbigging read a paper before the Manchester District Institution of Gas Engineers describing the invention of Mr. Gadd, who, in conjunction with Mr. W. F. Mason, had taken out a master patent; the numerous holders constructed under the system being known as the Gadd and Mason type. Under the superintendence of Mr. Newbigging, the first of these holders was erected in 1889 at the Northwich Gas-Works; and in the following year Messrs. R. & J. Dempster acquired a licence from the patentees to construct these holders, the firm later on purchasing the patent outright.

Mr. Gadd, who was a member of the firm of William Gadd & Sons, patent agents, of Barton Arcade, Manchester, was born on March 3, 1838, at Basford, and was educated at Derby, where he early evinced a preference for independent mathematical and physical studies. After leaving school, he had ample opportunity to develop his natural mechanical and inventive proclivities in his father's and uncle's workshops, getting that mental grasp of mechanics which he turned to such good account. As an inventor, his patents covered a wide range of subjects; his first serious invention (made at the age of about 17) being in connection with a lace machine. From Nottingham, he came up to London, where he served for a time with a civil and mechanical engineer; and on completing his agreement he determined to commence an independent professional career as a consulting engineer. He first went to Manchester for the purpose of conducting a series of experiments connected with weaving; and this undertaking developed so much that he was induced to permanently settle in that city. Mr. Gadd interested himself in telegraphy, and then in the generation of steam by means of oil. In addition to his inventions and experiments, mechanically considered, his investigations and literary work in connection with scientific research were very extensive. For a considerable time he was Hon. Secretary of the Scientific and Mechanical Society of Manchester. In 1889, he was elected a fellow of the Royal Microscopical Society, and became well known in many parts of the country as a Science Lecturer—his work in this direction being chiefly in connection with astronomy, electricity, magnetism, and heat. For some years he held the post of President of the Society of Patent Agents; and he was well known as an expert witness in the Law Courts in regard to patent and technical cases.

Combustion Experiments with Lignite.

There is given in Technical Paper No. 207 of the United States Bureau of Mines an account, by Messrs. Kreisinger, Augustine, and Harpster, of a series of combustion experiments with North Dakota lignite; this being part of an extensive investigation of methods of burning different fuels under power-plant boilers and in house-heating furnaces, with a view to effecting improvements which will decrease waste and promote more efficient utilization of fuel resources. The paper gives the results of tests of this lignite in two forms—natural lignite as it comes from the mine, and the carbonized residue from gas-retorts. The carbonized residue consisted of small pieces, all of them passed through a ½-in. screen, and 44 p.ct. through a ⅛-in. screen with square meshes. The material was dull grey, almost black; and its specific weight was 0·8—that of anthracite coal of similar size. The carbonized residue packs closely on the grate; and the fire requires a high draught, which causes uneven burning. The fire is nearly dark at the surface, because of the almost complete reduction of CO_2 to CO, which is a heat-absorbing process. The freshly fired carbonized residue is rather difficult to ignite, because of the low temperature at the surface of the fuel-bed. The results of the experiments indicate that the lignite and its carbonized residue might be burned successfully on an inclined step-grate with an arch extending from the bridge-wall over almost the entire length of the grate. The arch turns the flames and the hot gases back over the incoming fuel, thus aiding ignition. It also directs air admitted at the bridge wall against the fuel bed, and increases the rate of combustion. The process of combustion in the fuel-bed of the carbonized residue is shown by a number of curves indicating the percentage of oxygen, carbon dioxide, and total combustible gases in the fuel-bed at different distances from the grate. The most noteworthy feature of the curves is the complete disappearance of free oxygen at a point 1½ in. above the grate. The carbonized residue is a marketable product.

Natural Gas Statistics.—The "American Gas Engineering Journal" says that more than 2100 cities and towns in the United States are supplied with natural gas. The average price per 1000 c.ft. charged to domestic consumers is about 30c.; while the average price charged to manufacturers is less than 12c. Most of the towns and cities supplied with natural gas are in New York, Pennsylvania, Ohio, West Virginia, Kansas, Oklahoma, and California. In Ohio, 872,000 domestic consumers are supplied, in Pennsylvania 480,000, in California 239,000, in West Virginia 120,000, and in Oklahoma 95,000. The industrial consumers use twice as much gas as the domestic consumers.

ELECTRICITY SUPPLY MEMORANDA.

ONE of the most humorous aspects of the criticism of our electrical contemporaries at the present time is the violent struggle they are making to prove that the claims of the gas industry are not all that they are represented to be, and that in the work of conserving our coal measures there is nothing so capable as electricity. The "Electrician" is one of these papers; and its manner of dealing with the matter is of the most pronounced superficial order. What has called our contemporary into action again is that the "Daily Mail" published an interview with Lord Moulton on the subject of the Electricity Supply Bill. In the interview his Lordship gave some information as to the efficiency of gas-works processes, and the value of gas in different directions; and, doing so, he quoted Sir Dugald Clerk and Professors Smithells and Cobb. The writer in our contemporary makes a very high claim to knowledge superior to these scientists (who have devoted much of their lives to fuel problems), when seeking to correct their "misleading statements," for once more calling attention to which he hopes he may be forgiven. Certainly. We have never any objection to an electrical man showing that he does not know everything about gas, and that he can be very illogical. As to this latter point, it is the view of our friend that "it is very doubtful whether Lord Moulton's contention that it is as practicable to erect large gas-works and distribute from them energy as efficiently as from super-electricity stations would be physically possible." He does not state the technical grounds on which his doubts repose. What are they? How is it that the Beckton and East Greenwich gas-works have been so many years in existence, and continue to survive? They are super-gas stations. And where is the physical impossibility, seeing that in America tremendous volumes of natural gas are conveyed day by day hundreds of miles, and at very high pressures, to large cities? And what about the cities and towns in this country that are now drawing gas from distant coke-oven plants for supplementing their own supplies? Sheffield, for instance, from one source alone is taking over 7¼ million cubic feet per week. We said something about the electrical writer being illogical. He has his doubts about the erection of large gas-works and distributing from them energy as efficiently as from electricity stations. He "admits" that the gas-engine is as efficient as the electric-motor; but there are collateral advantages which make the latter the prime favourite. It does not matter much what he thinks; it is what the manufacturer thinks. Where the load and the running are fairly constant, a manufacturer would be foolish if he did not adopt gas-engines. As a matter of fact, we know that manufacturers are doing this in preference to putting in electric-motors, and what is more (where the favourable condition exists) electric-motors have been taken out to make way for gas-engines. Manufacturers claim the right to views, choice, and economy; and what is more they intend to stick to their right, and will not brook dictation. This was seen in Standing Committee B when the clause of the Electricity Supply Bill affecting manufacturers' freedom in installing private power plants was under discussion. Then the critic says that the field where electrical development is not so satisfactory, and where there is a certain amount of waste in using electrical energy, is in heating and cooking. Well now when one comes to think that heating and cooking go on in practically every house, and in many business and industrial establishments, why should there be any doubt as to the practicability of erecting large gas-works and distributing from them energy as efficiently as from super-electricity stations? As to electricity becoming the "sole form of illuminant," we advise our friend to go up Pall Mall, and reflect under the high-pressure gas-lamps, and then consider that high-pressure units as low as 60-candle power are being fixed in factories, and that in low-pressure lighting there is no standing still. Progress is not the monopoly of the electrical industry.

Kicking against Stone Walls.

Misrepresentation and Narrow Views.

Our contemporary says: "Lord Moulton's point is, as we understand it, that it is more economical to use coal in producing gas than in generating electricity." The understanding of our contemporary is at fault. Lord Moulton does not put that forward as a general proposition comprehensive of all applications; nor does the gas industry. Neither his Lordship nor the gas industry is so foolish; the foolishness rests with those who think the contrary. In his public utterances, and in those of gas men and the Technical Press associated with the gas industry, there has always been acknowledgment that electricity is as indispensable as gas in the system of any progressive country. Lord Moulton states what is an undeniable fact, that the efficiency of the gas-works process is 71 to 80 p.ct.; and in some cases it is more than this. He adds: "These figures are in themselves sufficient to show how unwise it would be, in the interests of economy of our coal resources, to try to supplant gas by electricity." Upon this our contemporary remarks that "the flaw in these arguments lies in the fact that the large heat return which the gas authorities claim is available when coal is used by them, is given in the mixed form of gas, coke, and tar," and that the gas cannot be used with the same efficiency as electricity. Why is the reason as to the combination of gas, coke, and tar described as a "flaw in the argument?" We fail to see. Perhaps our contemporary will enlighten us, when it has read the criticisms already made and to follow. As to efficiency, there is a lot of silly talk about the "efficiency" of electric appliances. In this matter of coal conservation, efficiency begins with the coal. Lord Moulton deliberately says "in the interests of our coal resources;" and all the efficiency—actual and assumed—of electric appliances will not compensate for the thermal and other losses that commence with the placing of coal under steam-boilers. One would think it would if faith were placed in letters such as Mr. Bernard M. Drake recently addressed to the "Morning Post." Then electrical energy cannot be converted back to heat without some loss. The greatest use for coal is for domestic heating. Some 36 million tons are used for this purpose every year. That, therefore, is the important field; and our contemporary says that the one where there is a [this is superb and non-committal] "certain amount of waste" in using electric energy is in heating and cooking. For the consumer in his domestic heating, it is not a question of thermal efficiency only of the appliances. It is efficiency combined with cost. The heating requirements in a house may be put in this order of importance: Room heating, general hot water requirements large and small (including hot-plate operations), and lastly the heat required for oven use. Now let our contemporary consider comparative efficiency and cost in this particular order, and then pursue inquiries as to the relation of these uses to the efficient employment of coal by gas and electricity suppliers—not overlooking the fact in connection with modern gas-fires that only some 20 to 25 p.ct. of the heat generated on combustion is found in the flue gases.

The Secondary Products.

Our contemporary seems to object to coke and tar being included in the thermal balance-sheet, to say nothing of the other products that have no thermal, but great industrial, value. We cannot understand why. Their production shows that only a portion of a ton of coal is expended in the making of gas; and so the gas industry is entitled to take credit for them. The critic makes another mistake, so disclosing very deficient knowledge of the subject. "Coke," he declares, "except when burned in bulk and in specially constructed apparatus, has only a low efficiency as a heat raiser." As coke is almost pure carbon (other than principally its ash content, which depends upon the proportion of ash in the coal), its calorific value is approximately that of coal. There is no smoke from it; and, when incandescent, its radiating power is intense. This is the reason why people who use coke mixed with coal in domestic grates find that they get a greater intensity of heat than from coal alone. For steam-raising at several electric stations and in several industries, coke is being used with great efficiency with forced draught; and it is also being employed to a considerable extent for other industrial purposes as well as for water-heating in bulk. Where, then, is the justification for speaking of its low efficiency as a heat-raiser? We should like our contemporary to explain; and while engaged on the explanation, we should like to be told whether in its view words speak louder than facts? There is another point. Supposing the carbonizing process is one that gives 10 cwt. of coke available for sale per ton of coal carbonized. If the coke is gasified and made into water-gas, it will, according to its quality, yield from 40,000 to 50,000 c.ft. per ton of 310 B.Th.U. gas. Supposing 25,000 c.ft. is made from the 10 cwt., this would mean 7,750,000 B.Th.U. Then the critic tells his electrical readers that tar does not count as a fuel at all. Pitch forms a large proportion of the weight of tar; and this is extensively used in the making of briquettes. Does not this count as fuel? Then what of the fuel oils? Have these no thermal value? Our critics certainly require educating on these subjects before they attempt to "educate" others in regard to them.

Gas Industry Makes Way in Coal Economy.

It would be much better if the electrical people would look facts in the face. As already remarked, progress is not the monopoly of the electrical industry. The gas industry is proceeding faster than it in the matter of fuel economy. Recently, Mr. W. F. Goodrich, of the Coal Controller's Department, stated that the industry, through improved methods of producing gas, had saved 3¼ million tons of coal in the past twelve months—this by steaming charges and the manufacture of gas from coke. And—mark this!—this has been accomplished under wartime conditions; and since the war ended, the contracts entered into for vertical retorts in which gas production can be increased by steaming are keeping the contractors going at high speed—in fact, gas undertakings cannot get their requirements met quickly enough. This shows that the gas industry is going along faster than its competitor in the matter of producing real fuel economy. In fact, the coal-saving mentioned is nearly half the total consumption of the electricity supply industry. Moreover, the Electricity Supply Bill is not going to render transformation of electricity generation something of immediate realization. Whatever is done to gain saving by fuel economy (fuel representing 25 p.ct. of electricity supply costs) will have its set-off in increased capital expenditure (representing close upon 50 p.ct. of the costs of electricity under existing capital circumstances). It is fair to take 500 units as the present average result of electrical generation per ton of coal, which is the equivalent of 1,710,000 B.Th.U. The demand conditions of the country are of such varied order that the electricity industry is not likely to reach universally the

best record of even to-day's fuel efficiency in a generating station. If we suppose that 2·8 lbs. may in the distant future become the average, this would only mean 2,736,000 B.Th.U. per ton of coal. Gas-works (without charge steaming or blue water gas) can make gas equal on combustion to 6 or 7 million B.Th.U. With blue water gas admixture, the make runs up to the equivalent of 8 to 9 million B.Th.U.; and with steaming (according to the physical character of the coal used) from that figure to the 14,160,000 B.Th.U. that was mentioned in Lieut.-Col. Woodall's paper before the Southern Association [see "JOURNAL," Nov. 25, p. 431]. The results he gave represent working "spread over a considerable period," and the high figure mentioned is being obtained by the sacrifice of only 25 p.ct. of the coke otherwise available for sale. In gas alone we have here an efficiency of about 50 p.ct. without taking into account the 7 to 8 cwt. of coke for sale, the tar, and the other products. This is the road the gas industry is pursuing. What under such circumstances is the good of the electrical people pretending that the efficiency of their appliances will compensate for the greater efficiency of gas-works processes over electricity generation? These are actualities which have to be faced; and they are not disposed of by such foolery as "Meteor" of the "Electrical Times" indulges in when he writes for the delectation of scientifically trained electrical engineers: "The electrical industry asks merely to be allowed to worry along with its little schemes of co-ordination, which after all can only postpone the day when the mantle will displace the half-watt lamp, the electric motor pass to the scrap heap, the Scotch express be driven from a gas balloon, and electricity be used only in the more dangerous parts of gas-works. . . . A gas-engine at the bottom of a fiery mine might easily go beyond its test-bed performance; and everyone knows that you cannot get an electric shock from a gas-driven coal-cutter."

The Reliability of Electricity.

Is it true that there was a failure of the electric light not many days since at the home of the Institution of Electrical Engineers, which has temporary tenants in it in the shape of a Government Department? It is true that last Sunday week the evening service at the Collegiate Church, Stratford-on-Avon, was conducted by candle light, owing to the failure of the electric light. It is true that on a recent Friday afternoon, there was an hour's failure of the electric supply in the centre of the City of Birmingham, owing to a fault developing on a generator. It is also true that this is not the only failure of supply that has lately happened, including one at Hammersmith on Nov. 30 (owing to the development of a short between the main bus bars of the generating station switchboard), and another at Hull, and still another at Batley.

High Electricity Prices.

The Electrical Engineer of Ealing (Mr. Douglas Knight) has been examining the current prices charged by some of the municipal undertakings; and he finds of those surveyed: Fourteen are charging 100 p.ct. over pre-war prices; five are charging 10d. per unit; and fifteen 9d. per unit. Also that applications are being made for power to increase charges as follows: Five undertakings from 8d. to 1s. per unit; two from 9d. to 1s.; one from 6d. to 10d.; five from 8d. to 10d.; one from 7d. to 9d., and one from 8d. to 9d. per unit.

Parliamentary.

The applications to Parliament for electric lighting and power authorization are not going to be large in the coming session. There are only eleven notices of Provisional Orders and nine of Bills. Tramway Bills and Orders make a more noble showing. So far as lighting and power are concerned, the Electric Supply Bill has no doubt created some uncertainty.

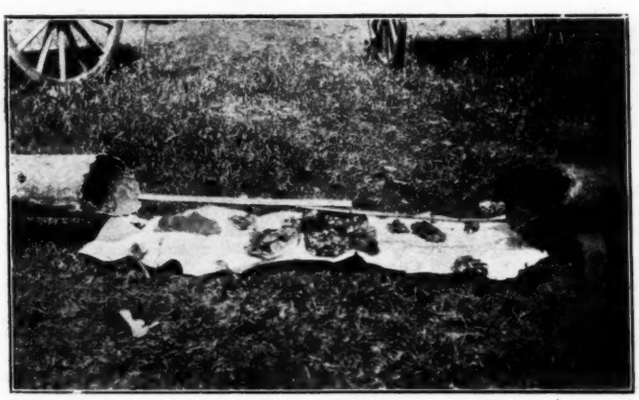
The Electricity Supply Bill.

Mr. E. Garcke, President of the British Electrical Federation, in a letter to "The Times" says: "I have no hesitation in making the prophecy that if this Bill be swallowed, electricity supply will in a little while be sick unto death; and I say this with a full sense of the responsibility which attaches to a prophecy." Nevertheless the Government and a faithful following who do not know much, if anything, about the matter are proceeding carelessly to drag the Bill through, without making any attempt to examine the warnings of men who are not in the habit of speaking in opposition to a Government measure without the deepest convictions. When in the House of Lords Lord Downham and Lord Moulton spoke in opposition to the Bill, they were supported by others. The Lord Chancellor, fathering the Bill for the Government, was the only one who then expressed himself in its favour. When the adjourned discussion took place, the only speakers in favour were Viscount Haldane and again the Lord Chancellor. But Lord Inchcape, Lord Erskine, the Marquis of Salisbury, Lord Ashton of Hyde, Lord Emmott, Lord Parmoor, and Lord Clifford of Chudleigh were all opposed to the measure. But the silent following was sufficient to give the Bill a second reading. The Committee stage, the Lord Chancellor announces, will be taken to-day.

A STRIKING GAS-MAIN FUSION.

THE photos reproduced are of a 6-in. gas-main belonging to the Oriental Gas Company, Ltd., at Calcutta, 3 ft. 6 in. of which was, as will be noticed, burned completely away by the fusing of a 550-volt electric tramway cable.

Mr. J. W. Bacon, the Mains Superintendent, to whom we are indebted for the photographs, explains that the cable was lying underneath the gas-main, 12 in. below the bottom of the pipe. It was laid in a vulcanized trough with bitumen. The "burn out" took place on the evening of Oct. 14; and owing to the great heat generated causing the surrounding earth to become fused into a shape somewhat resembling a drain-pipe, no escape of gas was noticed until the Tramway Company's workmen commenced excavating to locate their damage. On the morning of the 16th (forty hours after the "burn out") the fused earth in the bottom of their trench was so hot that many buckets of water had to be thrown on it before their bare-footed workmen could stand near enough to use their picks.



A Length of Six-Inch Gas-Main burned away by the Fusing of an Electric Tramway Cable.

Six-Inch Gas-Main in Trench burned completely away for a Length of 6 ft. 6 in. by the Fusing of an Electric Tramway Cable.

Temporary Increase of Charges Order.—The Ministry of Health have made an Order under the Statutory Undertakings (Temporary Increase of Charges) Act authorizing the Urban District Council of Portmadoc to increase their maximum charge for gas from 5s. 6d. to 6s. 6d. per 1000 c.ft.

Midland Junior Association.—At a meeting of the Association on Thursday evening of this week, there will be "paperettes" by Mr. J. Poulson, of Stafford, on "Reconstruction of Sulphate of Ammonia Plant," and by Mr. H. R. Hems, of Birmingham, on "Some Gas-Furnace Installations."

NATIONAL GAS COUNCIL OF GREAT BRITAIN AND IRELAND.

FIRST ANNUAL GENERAL MEETING—AS RECONSTITUTED.

THE First Annual General Meeting of the Council as reconstituted was held last Tuesday afternoon, at the Central Hall, Westminster—Mr. D. MILNE WATSON (the President) in the chair. The attendance was a large one; and throughout the proceedings striking unanimity of opinion was evinced.

The PRESIDENT having opened the meeting,

The SECRETARY (Mr. W. J. Smith) notified the receipt of a number of apologies for absence. He then read the minutes of the inaugural meeting of the reconstituted Council, dated Feb. 18 last; and they were confirmed and signed.

The list of members and *ex-officio* members appointed and nominated respectively by the District Executive Boards and the associated bodies was taken as read.

ANNUAL REPORT AND ACCOUNTS.

The next business was to receive the following report for the first financial year (subsequent to the reconstitution of the Council) ended Sept. 30, and the statement of accounts.

President: D. MILNE WATSON.
Past President: H. E. JONES.
Vice-Presidents:
SIR ROBERT A. HADFIELD, BART., F.R.S., J.P., D.Met., D.Sc.
(President of the British Commercial Gas Association).
SIR FORTESCUE FLANNERY, BART., M.P.
(President of the Gas Companies' Protection Association).
SIR DUGALD CLERK, K.B.E., F.R.S., M.Inst.C.E., M.I.Mech.E., F.C.S.
(President of the Institution of Gas Engineers).
SIR ARTHUR DUCKHAM, K.C.B.
(President of the Society of British Gas Industries).
Chairman of the Central Executive Board:
D. MILNE WATSON.
Vice-Chairman of the Central Executive Board:
ALDERMAN F. S. PHILLIPS, J.P.
Hon. Treasurer: ALDERMAN WM. KAY, J.P.
Hon. Auditors:
E. L. BURTON, F.S.A.A. G. CLARRY, F.C.I.S.
Hon. Secretaries:
F. W. GOODENOUGH. W. E. PRICE, Assoc.M.Inst.C.E.
Trustees:
SIR HALLEWELL ROGERS, M.P. H. WADE DEACON, J.P.
Manager: E. J. FOTTRELL, B.Sc., Assoc.M.Inst.C.E.
Secretary: W. J. SMITH.

INCOME.

The income for the financial year ending Sept. 30, 1919, contributed at the rate of 1s. per million c.ft. of gas made by the undertakings electing members to the Council, amounted to £10,795 15s. 1d.

EXPENDITURE.

The expenditure of the Central Executive Board during the period under review, including £3000 carried to reserve as set out below, amounted to £10,438 12s. 8d., which, allowing for the deficit of £70 6s. 11d. brought forward from the previous financial year of the National Gas Council as originally constituted, makes a total of £10,508 19s. 7d., leaving a surplus of £286 15s. 6d. These amounts exclude the sum of £1849 14s. 8d. received and paid in connection with the Gas Bills (Financial Hardships) Committee.

The sum of £2000 has been set aside for the purchase of suitable office furniture for the new premises to which the offices of the Council will shortly be removed, and a further sum of £1000 towards the purchase of the leasehold premises in question.

The sum of £50 was voted towards the expenses of the National Joint Industrial Council for the Gas Industry; a like amount being subscribed by the workers' side.

POLICY.

The headquarters staff have watched parliamentary and other Government measures affecting the industry, and, where circumstances require, have taken the necessary steps to follow up these matters.

During the eight months which have elapsed since the revised constitution and rules of the Council were adopted, the District Executive Boards and their Committees have been organized; and these are now rendering great assistance in dealing with local matters, and in ensuring that questions likely to interest or affect the whole industry are brought to the attention of the Central Executive Board.

The Council is now in communication with the Board of Trade regarding the legislation which is shortly to be introduced to place the gas industry upon a sounder financial basis than that provided by the temporary war measure—viz., the Statutory Undertakings (Temporary Increase of Charges) Act, 1918—and it is hoped that the annual report of 1920 will chronicle the successful passing of legislation to this end.

The Council have become members of the Federation of British Industries and the British Commonwealth Union, with the object of obtaining first-hand knowledge of movements affecting industry, and in order to secure for the gas industry general assistance from influential quarters.

The Central Executive Board have appointed Mr. E. J. Fottrell Manager, and Mr. W. J. Smith Secretary, to the Council.

PERCENTAGE OF UNDERTAKINGS THAT HAVE JOINED.

The following figures give an indication of the support the Council is receiving throughout the country:

	Company.	Municipal.
Percentage of undertakings connected with the Council compared with the entire kingdom .	31·7 ..	46·5
Percentage based on total make of gas in entire kingdom	77·7 ..	89·7

ACTIVITIES.

The Council's activities have been fully described in the printed reports issued in July, August, and September. It is therefore only necessary to set-out the headings under which such activities may be classified:

(1) BILLS IN PARLIAMENT:
- (A) Electricity (Supply) Bill.
- (B) Ministry of Ways and Communications Bill.
- (C) Compensation for Subsidence Bill.
- (D) Workmen's Compensation Act.

(2) DECERTIFICATION OF GAS-WORKS.

(3) COAL:
- (A) Stocks and prices.
- (B) Priority of supply.
- (C) Coal Transport Reorganization Scheme.
- (D) Royal Commission on the Coal Industry.
- (E) Subsidy to local authorities in respect of sea-borne coal.
- (F) Order of Coal Controller dated July 11, compelling certain gas undertakings to accept sea-borne coal from Durham and Northumberland, instead of rail-borne Yorkshire and Midland coal.
- (G) Subsidy on domestic coal.

(4) COKE:
- (A) Gas Coke Prices Order, 1918.

(5) FEDERATION OF BRITISH INDUSTRIES.

(6) FINANCIAL POSITION OF THE GAS INDUSTRY:
- (A) Orders under the Statutory Undertakings (Temporary Increase of Charges) Act, 1918.
- (B) Prospective Government Bills to provide financial relief.

(7) GAS:
- (A) Calorific power and inerts.
- (B) Coal gas and electrical supply industries of the United Kingdom. Report of Sir Dugald Clerk, Prof. Smithells, and Prof. Cobb.
- (C) Gas Standards. Report of the Fuel Research Board to the Board of Trade.
- (D) Household Fuel and Lighting Order.
- (E) Gas for housing schemes—Representations to the Minister of Health.
- (F) Fuel Economy Report of the British Association.
- (G) Gas and Coal (Emergency) Order, 1919.

(8) GAS APPLIANCES:
- (A) Hire charges.
- (B) Priority certificates.
- (C) Cost of manufacture.
- (D) Joint Standing Committee with the Society of British Gas Industries.

(9) PRICE OF GAS OIL.

(10) IMPORT AND EXPORT LISTS.

(11) METERS:
- (A) Guarantee.
- (B) Rental charges.

(12) OLD AGE PENSIONS. EVIDENCE BEFORE THE GOVERNMENT COMMITTEE.

(13) RESIDUAL PRODUCTS:
- (A) Ammoniacal liquor prices.
- (B) Benzol:
  - (i) Extraction for motor spirit.
  - (ii) National Benzol Association and National Benzol Company, Limited.
- (C) Spent oxide.
- (D) Tar—sale to distillers.

(14) ROYAL COMMISSION ON DECIMAL COINAGE.—EVIDENCE BEFORE THE GOVERNMENT COMMITTEE.

(15) WORKMEN'S COMPENSATION—EVIDENCE BEFORE THE HOME OFFICE COMMITTEE.

Interviews with Government Departments have taken place on the following subjects:

Government Department.	*Nature of Application.*
Board of Trade	Financial position of the gas industry.
Do.	Calorific power and inerts. Coal conservation.
Do.	Quality and composition of gas.
Do.	Substitution of sea-borne Durham for rail-borne Yorkshire coal.

Government Department.	*Nature of Application.*
Controller of Coal Mines	Coal stocks.
Do.	Household Fuel and Lighting Order.
Do.	Termination of coal transport reorganization scheme.
Do.	Gas Coke Prices Order, 1918.
Do.	6s. rise in the price of coal.
Ministry of Munitions	Decertification of gas-works.
Royal Commission on the Coal Industry	Nationalization of mines.
Pool Board (Petroleum Supplies) .	Price of gas oil.
H.M. Customs and Excise (Committee on Old Age Pensions) . .	Old Age Pensions—alterations in qualification for.
Royal Commission on Decimal Coinage	Difficulty of decimal system in connection with prepayment gas-meters.
Shipping Controller	Substitution of sea-borne Durham for rail-borne Yorkshire coals, at high rates of freight.
Ministry of Health	Use of gas in connection with State housing schemes.
Home Office Committee	Workmen's Compensation Act—Possible modification of.
Special Conference of Government Departments	Quality and composition of gas.
Fuel Research Board	Gas standards.

THE ADVANTAGES OF UNITY.

Alderman WILLIAM KAY, J.P. (Manchester), in briefly moving the adoption of the report and accounts, said he thought they might congratulate themselves upon the policy that they had pursued. If in the past unity was requisite—and as to the advantages of unity he thought they were all agreed—to-day it was more requisite than ever. ["Hear, hear."] What with interference by the Government, the trials and tribulations of the labour problem, and other matters, a National Gas Council, if ever it was necessary, was necessary to-day. The last coal problem seemed to him to be the most difficult that had ever arisen; and it was only by unity that they could successfully contend against these interferences with what might be called legitimate trade.

Sir PERCY K. STOTHERT, K.B.E. (Bath), remarked that, in seconding the proposition, he need add very few words to what Alderman Kay had said. It must be obvious to all of them that the activities of the National Gas Council in the past year had proved how badly such an organization was needed. The recital of these activities in the report showed the enormous amount of business that had been done; and he was sure that their thanks were due to the Central Executive Board for the time and trouble they had devoted to the affairs of the Council during the past year. In regard to the accounts, he would only say it appeared to him that the affairs of the Council were conducted in an extremely economical manner.

The resolution was then put to the meeting, and carried unanimously without discussion, though points upon the accounts were raised at a subsequent stage in the proceedings by Mr. T. H. HAZELL (Newport) and Mr. C. S. SHAPLEY (Leeds).

ADDRESS BY THE PRESIDENT.

The PRESIDENT said it was not his intention to make any long speech to them that afternoon, as he had had the opportunity during the last few months of frequently addressing them upon the topics which were uppermost in their minds. The annual report set out very fully the various matters that had been dealt with by the Council in the twelve months to which it referred. The part of this period since February had been covered by the reconstituted Council; and it was felt that very much more effective work had been accomplished within this time. Among the many innovations was the issue of monthly reports detailing the work carried out by the Council, which enabled every individual member, however far away he might be situated, in the remote districts of England, Scotland, Ireland, or Wales, to follow in his office exactly what was being done by the Council. The work of the Council had increased enormously during the period under review. Apart from the great questions of the financial position of gas undertakings, of coal, and of labour, there had been a hundred-and-one matters raised in connection with the industry; and every day brought fresh problems to be solved—fresh difficulties to be surmounted. The office was literally overwhelmed with work. When he told them that the average number of letters sent out was 190 a day, and the letters received anything between 50 and 90 a day, they would understand the vast amount of work that had been performed by their energetic staff. [Applause.]

THE ELECTRICITY SUPPLY BILL.

With regard to particular subjects, he might point out that the Council had been successful in obtaining a most important amendment of clause 15, sub-section 2 of the Electricity Supply Bill, which, as drafted, gave power to the Electricity Boards to supply surplus energy. It was felt that this might be interpreted to refer to gas, and might thus be a serious menace to gas undertakings. As a matter of fact, by the Committee who were considering the Bill it was held, by a majority, that the Electricity Boards as constituted by the Bill would be entitled to supply surplus energy in the form of gas. This the Council looked upon as a most serious matter, which ought to be immediately righted. The Council therefore put forward all the efforts they could, and drafted an amendment, which they were, he was glad to say, able to get incorporated in the Bill. The amendment provided that Electricity Boards should not have power to supply any form of energy other than electricity without the consent of the statutory gas undertakings of the district, and only then upon conditions agreed with such undertakings. [Applause.] In other words, if the great electric super-stations were, largely, he thought, due to their friend Sir Dugald Clerk's valuable report, forced in the future to carbonize coal, and therefore to make gas, they would not be able to enter the market in competition with gas undertakings, and would in the first instance have to offer the gas to gas undertakings so that they might deal with it. This was a most valuable concession, he thought, to their industry. ["Hear, hear."]

WORKMEN'S COMPENSATION.

The Council had also given evidence before the Home Office Committee on the Workmen's Compensation Act, and had very strongly opposed State interference in this matter—contending that the present system was less likely to be open to criticism on the ground of malingering, and that, under the present method, the settlement of claims was more efficiently dealt with than would be the case if the State took the business over—the quicker adjustment of certain claims being, in the opinion of the Council, absolutely necessary in many cases.

WORK IN CONJUNCTION WITH OTHER BODIES.

The Council had become members of the Federation of British Industries and the British Commonwealth Union, and had already obtained from these representative organizations most valuable assistance on behalf of the industry. One of the functions of the Council was to obtain parliamentary support to legislation beneficial to the industry, and also to create public opinion upon such matters.

STOVES AND METERS.

Two things of great importance which had been dealt with by the Council during the past year were stoves and meters. They had had more than one interview with the gentlemen who were manufacturers of these articles; and, while he was not at liberty to give any details, he thought they had impressed upon them that the gas industry in the present stage required very sympathetic action on their part. He had hopes—and very great hopes indeed—that the result of the interviews with the makers would be satisfactory to the industry. He could not go further than this at the present moment; but he trusted that in a short time he might be able to announce that satisfactory arrangements had been made in certain directions.

RESIDUAL PRODUCTS.

Residual products had also occupied their attention. The agreement for the sale of tar to distillers had been carried one step farther; but the matter had had to be submitted for counsel's opinion, as it was felt that it was drawn-up on the lines of a partnership, and so might prevent statutory undertakings from becoming parties to it.

FINANCIAL POSITION OF THE GAS INDUSTRY.

The report of the Fuel Research Board was an epoch-making event in the history of the gas industry. The Council had been in close touch with Sir George Beilby on this matter during the past year. The terms of this report would probably be incorporated in the Bill for financial relief which the Board of Trade had promised to introduce.

Now he came to the great and important question in which they were all deeply interested—that was, the financial position of the gas industry. In regard to this, they would all recollect that there had been a meeting at the Æolian Hall, at which, after very full discussion, it was agreed to make a recommendation to the industry that they should refrain for the time being, as far as possible, from promoting any further legislation—at any rate, with reference to matters dealing with sliding-scales and maximum prices. This recommendation had been very largely followed by the various undertakings up and down the country. The Government had not yet produced their Bill to deal with the gas industry alone; but there was no going back on their announcement that they did intend to do so. He had, in fact, got an assurance only the previous day that the Government were as determined as ever to see justice done to the industry ["hear, hear"]. But in view of the fact that, as those present knew, the Government were surrounded with great difficulties, they must not be too impatient to see the actual Bill in draft.

THE TEN SHILLINGS REDUCTION ON COAL AND THE SLIDING-SCALE.

Since the meeting to which he had just referred, very serious matters had arisen, particularly in connection with the coal question; and while he was going to speak about this subject separately, he would just like to say here, in connection with its bearing upon the financial hardships question, that the action of the Government in reducing the price of coal 10s. a ton to them for the purpose of making gas for domestic use, had absolutely, to his mind, ended the sliding-scale in its present application to gas undertakings. Let them follow him for one moment. The Government had a certain amount of money in hand, with which they could have reduced the price of coal, they were led to believe, by something like 2s. a ton all round. But, instead of doing this,

they had reduced it 10s. a ton for a section of the gas make. If the Government had made a concession of 2s. a ton on all the coal supplied, it would have been possible to reduce gas prices by 2d. or 1d. per 1000 c.ft.—depending upon the receipts for coke and other residuals; and this would have had the effect, under the sliding-scale, that those who did not come under the Temporary Increase of Charges Act would have been able slightly to increase their dividend. But the fact that they had decided, instead of giving them relief to the extent of 2s. a ton on all their coal, to devote 10s. a ton to part of it, made the sliding-scale inoperative, and it had become more than ever a thing of the past. This meant that the gas industry would have very seriously to consider its position *vis à vis* of the new legislation. Certain proposals had been made to the Government by which they might meet the case of the gas undertakings; but these would have to be reconsidered in the light of the new circumstances. If the Government were suddenly going to come down and reduce the price of part of their coal, without reducing the price of coal generally, there was no basis that he could see for the sliding-scale as it at present existed. Well, they were going to face this difficulty as they had faced others, and see if they could not find a solution. He was as convinced as ever that the Government meant to see justice done to the gas industry; and he believed they would see the Government Bill promoted early next year.

THE GREAT COAL QUESTION.

This reduction of 10s. in the price of coal used for making their domestic gas was a most embarrassing thing. In the case of the gas industry, it was complicated in many ways, chief among which was the fact that they were not all of them what were called suppliers of straight coal gas. There was the great complication of oil and water gas, which made it exceedingly difficult to arrive at a common basis for all undertakings. Furthermore, there was the great difficulty of ascertaining exactly what the domestic consumption of gas was. ["Hear, hear."] It was practically impossible. Then, again, there was the enormous difficulty of anticipating and prophesying what was going to be the price of their main residual, coke. The newspapers seemed to have got hold of the idea that 1s. per ton in the cost of coal meant 1d. per 1000 c.ft. in the cost of gas, and that 10s. in coal meant 10d. in gas—quite forgetting that if the undertakings lost 10s. on the coke, it would halve this, and instead of being 1d. to 1s. it would become ½d. to 1s., and instead of being 10d. for every 10s. it would become only 5d. They would all appreciate the complications that would arise. Some concerns made 20 p.ct., some 40 p.ct., and others 50 p.ct. of water gas; and while some might be able to reduce the price of coke, others could not do so. Therefore it was absolutely impossible for them to guarantee to the Coal Controller any definite reduction in the price of gas. ["Hear, hear."] This battle had been fought out all through the previous week. There had been interview after interview. In this connection, he would like to pay his tribute to the great consideration, attention, and courtesy of the present holder of the office of Coal Controller. Mr. Duncan was the most sympathetic head of a Government department that he had ever come in contact with. But for all this, it was for the gas industry to show him that he could not promise any definite reduction in the price of gas through the industry as a whole; and the Central Executive Board had told him that, unless the figure to be given by the President of the Board of Trade was a very wide one indeed, he had better not mention any figure at all. They had at the same time assured him that the industry was perfectly willing to pass on to the gas consumer every penny they saved; and he (the speaker) would appeal to the meeting, and—through the gentlemen who represented the Press—to those who were not present, that, if they did have any reduction in price, they should deal with it absolutely fairly and squarely, and see that the domestic consumer got the whole of the benefit. It was not for them to question the methods of the Government, but to carry out their scheme, and pass on the money to the domestic consumers of gas. As, however, he had said, the difficulties were enormous; and they had not yet been able to agree upon any statement with the Coal Controller's Department. What they had told him was that, if any statement was to be made, it must have the Council's general sanction. He hoped he was not putting the matter too high. The Executive Board were not trying to dictate; but they had got to keep their end up, and it would not do to allow the Coal Controller to make an announcement that might raise false hopes in the breast of the domestic consumer. The reduction they would be able to give on domestic gas was exceedingly doubtful. Some might be able to give 7d. or 5d.; but a great many would not be able to give more than a very few pence. They therefore wanted to be safeguarded, so as to avoid being told afterwards they were holding on to some of the money, which was being passed on by the Government. The Government had been warned that, with the complications of coke and water gas, it would be impossible to hand over anything like the 10d. which had been talked off in the papers.

APPEAL FOR UNITY.

So much with regard to the work of the National Gas Council. He was not there in any sense as an apologist, and certainly not to praise the Council. He had often appealed for unity, and he still did so to-day. They all realized by this time that unity was essential. What he wished to say was that it was absolutely necessary they should have a National Gas Council at the present moment. How could they deal with the problems they were face to face with, if they had not a great body representing the industry? To whom were the Government to go if there were no National Gas Council? There must be some central body; and they must have a National Gas Council. It was for them to see that the Council was worthy of its national title, by doing well the important work which had been entrusted to them by the industry. [Applause.]

ELECTION OF OFFICERS.

Mr. J. H. ELLIS (Plymouth) moved that those who had held office during the current year be re-elected for the ensuing twelve months. He said that at a meeting of the Executive that morning the unanimous wish was expressed that Mr. Milne Watson should continue to hold the office of President. [Applause.] Though no doubt, as the President had then said, in most circumstances it was undesirable that these offices should continue very long to be held by the same individual, and opportunity should be afforded for change, it would be very unwise to make an alteration at the present time, when the reins of this team were so firmly grasped, and when the coach was being so skilfully driven upon a very difficult road indeed. They owed their thanks to the President, and all the officers of the Council, for everything they had done. They could not possibly be better served than they had been.

Mr. H. E. JONES said that he had specially asked to be allowed to have the honour of seconding at any rate the re-election of the President. The Council would always, he trusted, be careful to place in the Presidential Chair someone who was deeply and widely responsible for the great industry which they represented—that of supplying gas. No matter how ornamental might be the position of a man in the world, they did not want an ornament there. What they needed was a solid worker. That the chair of the Council was no sinecure, he had the very best means of knowing, as he had himself filled it for two years. It was full of anxiety, hard work, and thanklessness, because everyone who could not quite fit his particular grievance into their operations must ventilate it and worry them. In Mr. Milne Watson they had a man who, by the enormous responsibility of his position in the gas world, must know the whole of their business from A to Z. If they had previously had any doubt about this, it would have vanished on hearing his capital address just now, in which he had dealt with points that would not have been familiar to, and would not have struck, a casual ornamental president of such a Council. It needed a man who followed all the operations of gas undertakings, and knew the exact way the expenditure and receipts bore upon their profits, to fathom the weakness of this extraordinary measure of reducing the price of coal. Personally, he could not see why the employer of labour (from whom the workman got his wages) should pay 10s. a ton more for the quantity of coal used in the industry than did the labourer for the single ton he bought for his own purposes. The complete idea of wholesale and retail trading was done away with. He hoped they would all remember that it needed training and experience to fill the Presidential Chair of the Council. Mr. Milne Watson should do it all the better for the first year he had had—following his (Mr. Jones's) humble self, who did it very imperfectly—and he believed next year he would do still better for the two years he would then have had. In fact, he trusted they would not part with him until he definitely told them, as he (the speaker) had had to do, that his age made it impossible for him to continue in office any longer. He sincerely hoped that Mr. Milne Watson would adorn the chair for a great many years to come. [Loud applause.]

The re-election of the President and the other officers was cordially agreed to by the meeting.

The PRESIDENT said he was greatly obliged to the meeting for the way in which they had re-elected him President of the Council for another year. He very greatly appreciated this proof of their confidence in him. When it was suggested that morning that he should be nominated again, he had said, and he repeated now, that he was not a believer in these offices continuing to be held indefinitely by the same individual. They wanted to encourage men to come along and take up responsibility. At the same time, he fully realized the weight of the reasons that had just been given why he should be asked to remain for another year in the chair. He would do his best; and he hoped that at the end of another year they would at any rate be able to sound some little note of triumph.

THE STAFF THANKED.

Alderman KAY remarked that the Council owed a deep debt of gratitude to the staff for their services. The work was growing every day, and became more and more onerous; and without a competent and able staff, a big undertaking like this cou'd not go on. They had been well served in the past; and he moved a hearty vote of thanks to the staff, without exception, from the highest to the lowest, for the excellent manner in which they had carried out their duties.

The PRESIDENT said he would like to second this. No one could wish for a more loyal staff. They had been unsparing in their efforts, from morning to night. They could not acknowledge too heartily their zeal and unfailing courtesy in the difficult circumstances in which they had been working.

The vote was cordially passed, and a brief acknowledgment by Mr. E. J. FOTTRELL terminated the meeting.

THE GERMAN GAS ASSOCIATION.

Meeting at Baden-Baden.

The German Gas Association, on Sept. 25 and 26, held the first meeting on any considerable scale that had been attempted since the Munich meeting of 1914, which was attended by a party of English gas engineers so near the fateful days of August. The following brief account is compiled from various numbers of the "Journal für Gasbeleuchtung," which is now once again reaching us with pre-war regularity.

The meeting was held this year in Baden-Baden, and some 480 members attended. In the regretted absence through illness of Herr Ernst Körting, of Berlin, the chair was taken by Herr Götze, of Bremen. At the conclusion of the meeting, Herr Körting was re-elected President for the following year. In accordance with the seriousness of the times, there was complete absence of festive ceremonies. In the papers that were read, technical detail gave way almost entirely to questions of general policy in the industry, which has taken its full share of the industrial and economic unrest which has spread over Germany since the 1918 revolution.

In the same week at Baden-Baden were held meetings of the Mid-Rhine Gas Association, of the German equivalent of the "B. C. G. A.," and the Gas Managers' Association, and also the initial meeting of a newly-formed Coke Syndicate.

Report of the Committee.

"Much harder tasks than those which were ours under war conditions have now fallen to our lot through the unfortunate end of the 'ring,' the lamentable collapse of physically and mentally overwrought forces, the whirl of the revolution, and the treaty of might and revenge which our opponents have been able to force upon us. If there is one thought on which we can find support, and strengthen our belief in ourselves, it is the knowledge of the array of means of destruction which Germany's enemies have considered it necessary to maintain against the completely collapsed economic life of the country. It is at any rate a recognition." In such terms opens the report of the Committee. It then relates how Herr Lempelius, the Director of the Zentral für Gasverwertung (the German Commercial Gas Association), had in May taken over the direction of the Association also, and so had brought into still closer touch the commercial and the technical sides. The coal difficulties are next mentioned. Immediately after the armistice a promise was received from the Coal Controller that supplies would be kept up for the gas industry; while coke-ovens were to be limited. Unfortunately the promise could not be redeemed, owing to the labour conditions at the mines. But the industry was able to obtain representation, both of capital and labour, on the supreme Coal Council which was set up early this year. As regards labour conditions in the industry, the Committee had constituted itself a collecting centre for any information or suggestions that undertakings were able to contribute, and members had been asked to assist in this very important work.

The industry had been represented at the protracted confidential conferences which had taken place between nitrogen producers and Government officials, and which had resulted in the formation of a Company under the name of the Nitrogen Syndicate, Ltd. Coke-ovens and gas-works had alike succeeded in having the sale of their output of sulphate of ammonia guaranteed; and, in spite of their proportionately small output, the gas-works had secured a seat on the Board of the Syndicate. Owing to the necessity for increasing road transport, when so much rolling stock and so many locomotives had to be ceded to the allies, the Government had found the continued commandeering of all tar products necessary, and had threatened to limit coal supplies to anyone who used tar for heating purposes. This measure the Committee had opposed—taking the line that an increase in coal supplies would be more likely to limit the consumption of tar for heating purposes.

The report concludes with a few administrative details of the Association, and a statement as to the financial situation, and is followed by short accounts of the doings of affiliated societies.

Presidential Address.

Herr Götze, in opening the meeting, referred to the serious situation in which German industry stood, as a result of the loss of the war. They must not, however, lose heart, but must find their salvation in hard work. In the particular case of the gas industry, he recommended co-operation and interchange of experiences and information. In conclusion, he read to the meeting the presidential address of Herr Ernst Körting, who, as mentioned above, was absent owing to indisposition. The address examined the political and economic situation of the country, and traced the lines by which it could return to healthier conditions, and by which the gas industry could regain the standing to which its pre-war accomplishments had brought it.

Reports of Commissions.

The reports of Commissions were presented by their various chiefs. Dr. Karl Bunte introduced that of the Instructional and Experimental Gas-Works of Karlsruhe. These had been considerably enlarged in 1914-15, and had resumed operations at the end of last year. Some 150 inquiries from gas-works had been experimentally dealt with during the year—including coal analyses, questions of water gas, benzol, and in fact all bye-products. Valuable work had been done in testing new apparatus which had been placed on the market—much of it claiming attractive economies of various kinds, which tests had often failed to substantiate. Lately, inquiries had started to come in again from neutral countries. Two appendices to the report give recommendations for standard carbonization tests, and instructions for determining calorific values by the Junkers calorimeter.

In technical matters, the Special Commission on Mains and Services had little to report. They had been chiefly concerned during the year with legal matters, and had given special attention to a case which had gone against the Municipality of Essen for damages due to an explosion following a break in a gas-main. The Commission on Gas-Works Management had been mainly inactive during the war, and asked the meeting for instructions on what lines they were now required to work. One particular point is raised in their report—how to adjust the sale of gas through slot-meters to correspond with the diminished value of the currency, and the substitution of coinage by paper money.

Papers Read.

The first paper was by Herr Lempelius, on the "Coal Situation in Germany." The author compared, and illustrated graphically, the pre-war, war-time, and present situations. He showed that in the last year of peace, 1913, the German output exceeded the home consumption by 24 million tons (metric); and the output was on the increase. In August, 1914, the output dropped to about one-half; but after this it gradually and steadily rose, until, in August, 1917, it was only about 6 p.ct. behind the peace-time average. From this time onwards it remained fairly steady, until the social upheaval in November, 1918, brought it down to 9 millions, against a peace-time average of 16 millions. The lowest point—6 millions—was reached during the great strike in April of this year; but when the paper was written [in July] it was up to 11 tons, and still increasing. The author enlarged on these and other figures, dealt with the amount of coal that Germany has to deliver to the allies, and came to the conclusion that the outlook was black, and that even the clearest eyes could not see the end of their troubles. In summing-up, he pinned his hopes and his faith to "brown" coal (lignite), of which large reserves are available in the country. This is so much easier to win than the ordinary coal, that he hoped important and rapid developments would take place in this direction. But even this hope could lead to nothing without an improvement in the railway situation. Without great changes in the workshops, engines and rolling stock shortages would continue for years to paralyze Germany's industrial life, however much coal was produced.

Dr. Karl Bunte's paper, which followed, dealt with the same subject, and suggested the lines on which gas-works should go. It showed that Germany is not without its coal control troubles; that coke-ovens are producing more industrial coke than is needed, while gas-works are short of coal; and that in some cases better gas coal is going to electricity works than to gas-works. Dr. Bunte also held out but little hope of an improvement in the supply for a long time to come. He recommended uniformity in working standards, but suggested that calorific values should not go much below 4300 calories per cubic metre [475 B.Th.U. per cubic foot]. This he considered the most economic standard.

The next paper was by Herr F. P. Tillmetz, of Frankfort-on-Main, on the subject of "Labour Conditions, and Means of Increasing Production." His tone was pessimistic, and few tangible suggestions forthcoming, except profit-sharing and co-partnership. Their success in English gas undertakings was quoted; and it was strongly urged that some such system should, without delay, be tried in Germany.

Herr Kobbert, of Königsberg, read a paper dealing with the "Economic Statistics of Gas-Works." He maintained that the aims of the German gas industry must be the same now as they were before the war; and he summed them up as being: (1) The highest technical development and the most scientific use of fuel, and the continuously diminishing employment of manual labour and unsound methods; (2) the lowering of gas prices to the consumer, at the same time as widening the field of consumption; (3) economically successful working, to the advantage of the state as well as the industry.

The last paper was by Dr. Bueb, of Ludwigshafen, on the subject of the ammonia situation in Germany. Dr. Bueb during the war was Commissary for the Nitrogen Industry, which presumably means Nitrogen Controller, and was therefore highly qualified in his subject. The paper will be dealt with in a subsequent issue.

Natural gas has been struck, at a depth of 2500 feet, in a bore in the Penrith district of New South Wales. There is also evidence of oil—both being of true mineral origin.

"Efficient Boiler Management," with notes on the operation of reheating furnaces, by Mr. C. F. Wade. Boiler and Fuel Economy Specialist, has just been published by Messrs. Longmans, Green, & Co., of Paternoster Row, at the price of 12s. 6d. net. The author explains, in their proper sequence, the elementary scientific principles underlying the various sections which are embraced by the title of the book, together with the systematic practical application of these principles in order to obtain the most efficient results. Typical examples of appliances have been selected to illustrate the text.

NET COST OF COAL FOR VARIOUS SYSTEMS OF GASIFICATION.

(*Continued from p.* 543.)

By "WORKS MANAGER."

Net for Coal and Cost of B Th.U. Delivered to Consumer.

IN view of the wide variations in the possible price of coal, charts for net for coal have been prepared for coal constant prices from 20s. to 45s. per ton, in steps of a few shillings, in order to see the general effect of widely different coal prices. Two of these charts—No. 7, coal constant at 36s., and No. 8, coal constant at 45s.—are reproduced. In all calculations the cost price of coal includes delivery to the works and all costs of handling prior to charging into the retorts.

Chart 7.—This shows the general economy of verticals over horizontals and horizontals and 25 p.ct. blue water gas on a net for coal basis. It is interesting to note that at 40s. and upwards net receipts for coke per ton, horizontals are actually cheaper on a net for coal basis than horizontals and 25 p.ct. blue water gas. There are many other points of interest, such as the intersections of the various graphs and relative slopes. The study of these is left to the reader.

Chart 8.—This is in general similar to Chart 7.

In considering Charts Nos. 1 to 8, it cannot be too carefully borne in mind that it is "net for coal" which is under review. In deciding which system of gasification is the most economical on a B.Th.U. basis, the quality of the gas, the labour, and other costs of manufacture, purification, distribution, and general charges must be taken into account.

If the costs per 1000 c.ft. for labour, purification, maintenance, distribution, and general and capital charges be added to the net for coal per 1000 c.ft., the cost of 1000 c.ft. delivered to the consumer is obtained. Assuming that gas will be sold on a B.Th.U. basis, it follows, obviously, that a greater volume of low quality gas must be supplied than of a higher quality gas, so as to deliver a given number of B.Th.U. A million c.ft. of 530 B.Th.U. gas gives 530 million B.Th.U.; and to supply this quantity of B.Th.U. will require:

By A. Verticals, high steam	1·151	millions	× 460 =	530	millions B.Th.U.
,, B. Horizontals . . .	1·000	,,	× 530 =	,,	,, ,,
,, C. Horizontals and blue water gas . . .	1·129	,,	× 470 =	,,	,, ,,
,, D. Verticals, moderate steam	1·070	,,	× 495 =	,,	,, ,,
,, E. Verticals, non-steam	1·000	,,	× 530 =	,,	,, ,,

That is, to deliver the same number of B.Th.U. by 460 B.Th.U. gas 15 p.ct. more volume must be delivered than would be necessary with 530 B.Th.U. gas. It is reasonable to assume that this extra 15 p.ct. could be delivered without increasing appreciably the total standing, management, and distribution charges; so that, per 1000 c.ft., these charges would be slightly less for the lower quality gas.

The following table shows the values taken for the costs per 1000 c.ft. of gas, additional to the net for coal per 1000 c.ft.

TABLE No. III.

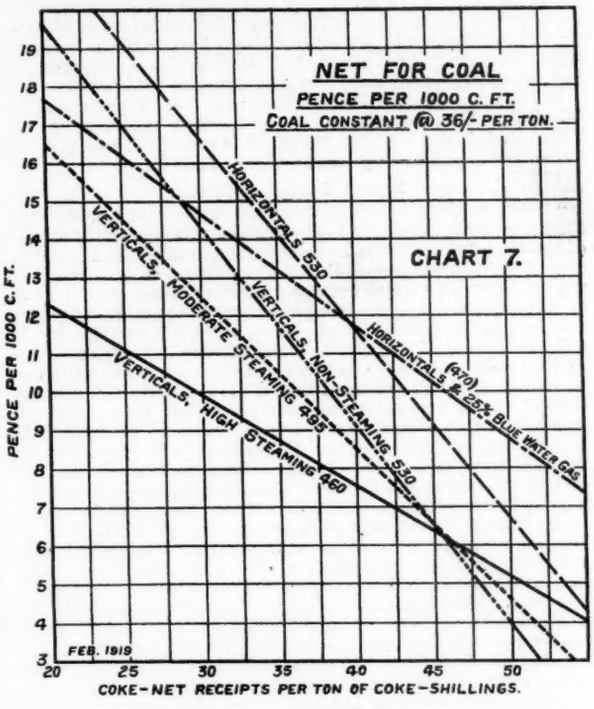
—	A. Verticals. High Steam. 460 B.Th.U.	B. Horizontals. 530 B.Th.U.	C. Horizontals. 25 p.ct. Blue Water Gas. 470 B.Th.U.	D. Verticals. Moderate Steam. 495 B.Th.U.	E. Verticals. Non-Steam. 530 B.Th.U.
	d.	d.	d.	d.	d.
Carbonizing, coke removal, engine drivers, boiler men, &c.	2·40	3·10	2·80	2·40	2·60
Salaries, manufacture .	0·52	0·60	0·55	0·56	0·60
Purification	0·35	0·40	0·35	0·37	0·40
Repairs and maintenance of works	6·07	7·00	5·50	6·55	7·00
Distribution, including mains and services. All general establishment charges.	5·20	6·00	5·30	5·60	6·00
Capital charges . . .	5·55	6·00	5·90	5·97	6·40
Total per 1000 c.ft.	20·09	23·10	20·40	21·45	23·00

Carbonizing, &c.—The lower cost for wages in making water gas is taken into account in the cost for C.—horizontals and 25 p.ct. of blue water gas. In the case of verticals, the writer considers that the figures given for wages are on the high side, especially in the case of steaming, since with a certain type of plant 1·3 times the non-steaming volume output can be obtained, whereas only 1·1 times has been reckoned on.

Repairs and Maintenance.—The figures are again on the high side in the case of verticals, but are intended to cover the cost of steam for steaming, though it has been demonstrated that steam for this purpose can be generated at a very small cost from the waste heat from the settings.

Capital Charges.—The extra cost of verticals and the lower cost of water-gas plant has been allowed for.

By reading from the net for coal charts for any particular system, and adding on the additional charges as given in Table No. III., the total cost of 1000 c.ft. of gas delivered to the consumer is obtained. With B system, 530 B.Th.U. gas, 1000 c.ft. = 5·3 × 100,000 B.Th.U.; so that by dividing the total cost per 1000 c.ft. by 5·3 the cost of 100,000 B.Th.U. is obtained. In the case of A system, 460 B.Th.U. gas, 1000 c.ft. = 4·6 × 100,000 B.Th.U. Therefore the total cost of 1000 c.ft. divided by 4·6 gives the cost of 100,000 B.Th.U.; and so on. Working in this way, Charts Nos. 10, 12, and 14 have been prepared.


NET FOR COAL
PENCE PER 1000 C. FT.
COAL CONSTANT @ 36/- PER TON.
CHART 7.
HORIZONTALS 530
VERTICALS, MODERATE STEAMING 495
VERTICALS, NON-STEAMING 530
HORIZONTALS & 25% BLUE WATER GAS (470)
VERTICALS, HIGH STEAMING 460
FEB. 1919
PENCE PER 1000 C.FT.
COKE-NET RECEIPTS PER TON OF COKE-SHILLINGS.

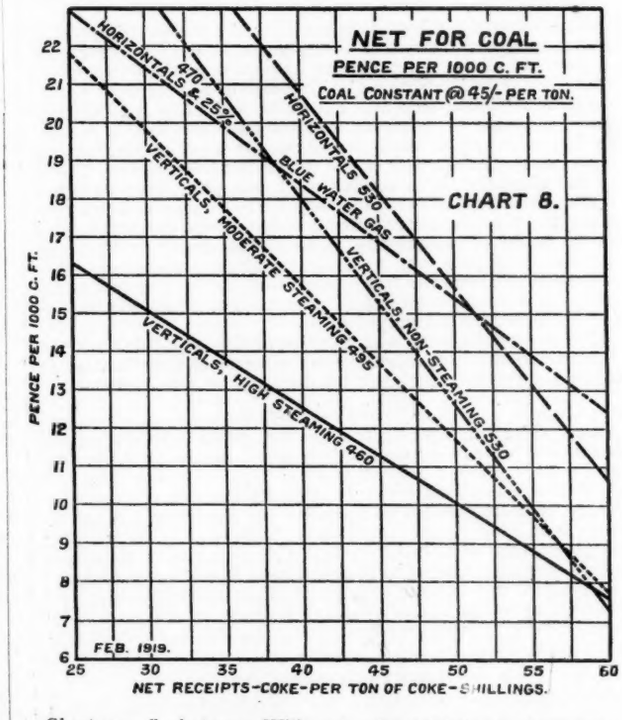
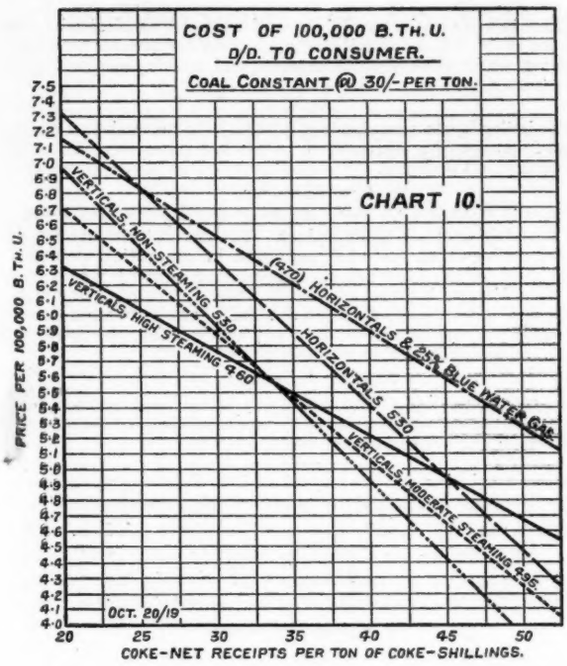


Chart 10.—*Coal at* 30s.—With net coke receipts at about 25s. per ton and upwards, horizontals show lower cost than horizontals and 25 p.ct. blue water gas. At about 34s. for coke, the economy of steaming verticals ceases; and for higher coke prices the economy of 530 B.Th.U. gas increases progressively.



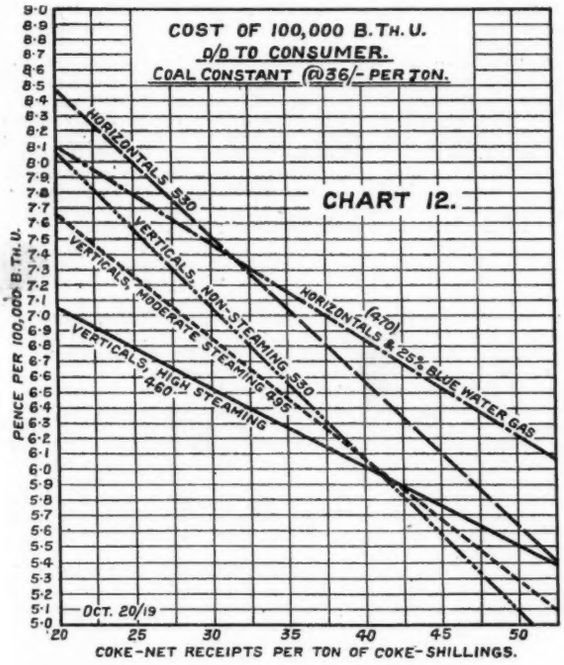


Chart 12.—*Coal Constant at* 36*s.*—Horizontals cheaper than horizontals and 25 p.ct. blue water gas at about 31s. for coke. Economy of steaming verticals ceases at about 41s. for coke.

Chart 14.—*Coal Constant at* 45*s.*—Horizontals cheaper than horizontals and 25 p.ct. water gas for coke at 40s. and upwards. Economy of steaming verticals ceases for coke at about 52s.

It is readily seen that if distribution and general charges had been reckoned at (say) 12d. per 1000 c.ft. of 530 B.Th.U. gas, instead of 6d., and the corresponding figures for the other grades of gas at amounts proportional to the quality—*e.g.*, $\frac{12 \times 460}{530}$ = 10·4d. per 1000 c.ft. of 460 B.Th.U. gas—that the relative positions of the graphs one to the other on any particular chart would not be altered. The absolute chart readings would be altered; but the slopes of the graphs would not be affected. Also suppose that tar be taken at 4d. per gallon instead of 2·2d.—*i.e.*, an increase of 1·8d. per gallon = 82 p.ct. nearly. This will lower the cost of 100,000 B.Th.U. by:

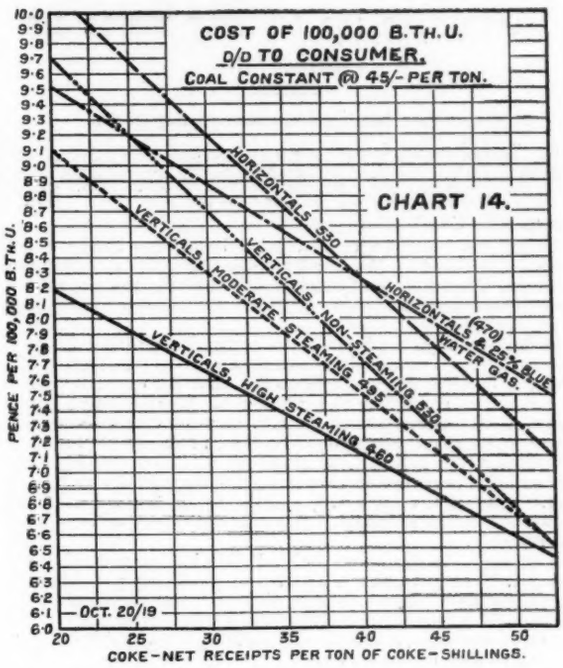
For A system, $\frac{\text{gallons. } 14{\cdot}2 \times 1{\cdot}8}{21 \times 4{\cdot}6} = 0{\cdot}29$d. per 100,000 B.Th.U.

" B " $\frac{\text{gallons. } 10 \times 1{\cdot}8}{12 \times 5{\cdot}3} = 0{\cdot}28$d. " " "

" C " 0·23d. " " "

" D " 0·31d. " " "

" E " 0·38d. " " "



These values differ only to a small extent. The absolute chart readings would be altered by the above values; but since these values are very nearly equal, the relation between the graphs on any particular chart would be hardly affected. The increased tar price would operate slightly against C system and slightly in favour of E system, when comparing all the systems.

Coal Storage.

The "Iron and Coal Trades Review" describes a novel method of storing coal in carbonic acid gas—which combines the advantages of the overhead bunker with the absolute safety of storage under water against spontaneous ignition—adopted recently at Dortmund, in Germany. It consists of three cylindrical bunkers (with semi-spherical tops and bottoms) each bunker holding 2500 tons of coal. There are three outlets in each bunker for withdrawing the coal, and three holes at the top for receiving it. The lower outlets close gas-tight; while those on top, although requiring a good fit, need not necessarily be gas-tight, since carbonic acid gas is nearly twice the weight of air, and does not therefore escape at the top. A simple structural steel tower unloads the coal by grab from a barge; and the coal is then shot into a small hopper, from which it is fed on to a push-plate conveyor, the path of which completely envelops the three bunkers in the vertical plane. It can therefore both feed and reclaim the coal. There is a slight leakage of carbonic acid gas during the withdrawal of the coal; but this is said to be small, and can be easily replenished.

Wrong Impressions about Gas-Meters.

Mr. F. J. Schafer, in a paper which he read before the twenty-sixth annual convention of the Pacific Coast Gas Association, referring to gas-meters, called attention to the popular error entertained by many gas consumers, who assert that the gas company supply them with excessive pressure, to the end that the meter would spin round faster—thereby helping to increase the gas bill. Nothing, he said, is more ridiculous than this assertion, inasmuch as gas cannot pass through the meter quicker, regardless of the pressure, unless the consumer is either using the gas or else wasting it. As a matter of fact, increased pressure at the meter, with proper use at the appliance consuming the gas, would benefit the consumer, for the reason that gas is compressible, and the meter measures volume only. If any gas company were foolish enough to supply their consumers with gas at a pressure of (say) 15 lbs., and charge for it on the basis of meter measurement, the consumer would obtain 2 c.ft. of gas for every cubic foot for which he paid. It has also been the author's experience to come in contact with people who claim that they have actually watched their meter when no gas was being used—caught it in the act—and according to their story, the meter was merrily spinning on, piling up foot after foot on the indicator, thereby reaping a harvest of dishonest gold for the overflowing coffers of the gas company. In a case of this kind, he went on, there can be but two explanations for the wonderful performance—either there is a leak somewhere on the premises, or the tale was born of magnified and unjust suspicion, and had no foundation in fact. If the construction of the meter were only partially understood, it would be known that the operation of it depends absolutely on flowing gas; and when the flow is stopped, the meter has been deprived of the energy which made it move.

MANCHESTER AND DISTRICT JUNIOR GAS ASSOCIATION.

Visit to the Southport Corporation Gas-Works.

On Saturday, the 6th inst., about fifty members of the Manchester and District Junior Gas Association availed themselves of the invitation extended to them, and visited the Southport Corporation Gas-Works.

Under the guidance of Mr. John Bond, the Engineer and Manager, assisted by Mr. Christian, the Distribution Superintendent, and Mr. Smith, the Chemical Assistant, the party spent two hours inspecting the works, of which the following particulars were given.

In the year 1850, the Southport Corporation built gas-works in Eastbank Street, at a capital expenditure of £3528. During that year the make of gas was 578,000 c.ft., and the quantity sold to 69 consumers amounted to 295,000 c.ft. There were 79 public lamps, which consumed 230,700 c.ft. of gas. Gas making continued at Eastbank Street until June 20, 1878. After that date, the whole of the gas was manufactured at the Crowlands Gas-Works. Gas manufacture commenced at these works on July 16, 1872. From that date to 1878, both the Eastbank Street and Crowlands works supplied gas to the consumers of Southport and Birkdale.

At present, the Corporation Gas Estate has an area of about 12 acres. The gas plant is capable of producing 3,000,000 c.ft. of gas per day. There is also plant for the manufacture of sulphate of ammonia, concentrated ammonia containing 30 to 35 p.ct. of ammonia, and a tar distillation plant capable of dealing with 50 tons of tar per day.

Gas is supplied to consumers within the borough at 4s. per 1000 c.ft., with a discount of 5 p.ct. if the account is paid within a month. Special prices at the following rates are charged for gas for power and commercial purposes in Southport: Consumers of over 250,000 c.ft per quarter, 3s. 6d. per 1000 c.ft.; 125,000 to 250,000 c.ft., 3s. 8d.; 62,500 to 125,000 c.ft., 3s. 10d.; less than 62,500 c.ft., 4s.—less 5 p.ct. discount. The make of gas for the year ended March 31 last amounted to 562,636,000 c.ft.; and the gas sold for cooking, lighting, heating, and power purposes (including street lighting) was 530,680,500 c.ft. The make of residual products for the year ended March 31, 1919, was: Coke, 23,962 tons; breeze, 7997 tons; tar, 2224 tons; sulphate of ammonia, 397 tons. The total capital expended to March 31 last amounted to £309,150, and the capital on mortgage was £153,271. This works out at 11s. 8d. and 5s. 9d. respectively per 1000 c.ft. of gas consumed.

RETORT-HOUSE.

The whole of the retort-house has been renewed with modern settings, and an installation of West's vertical retorts, capable of manufacturing 1¼ million c.ft. of gas per day, complete with coal elevator and hoppers, two gas-engines for working the extractor, and two gas-engines for working the coal elevator; also the necessary coke conveyor and hopper, to which is attached a shoot for loading coke into wagons. This plant was erected in 1913. The charges of coal passing through the vertical retorts are steamed under a pressure of 30 lbs. at the nostrils; and the coal gas made from these retorts mixes with the gas made from the horizontal retorts at the foul main.

STOKING MACHINERY.

The stoking machinery, which comprises two drawing machines and two charging machines, was made by West's Gas Improvement Company. The machines work with compressed air at 60 lbs. pressure per square inch, and are capable of drawing and charging ninety retorts per hour.

COAL ELEVATORS.

Coal is brought into the works by wagons, and is tipped into the breakers and then elevated into hoppers fixed in the roof of the retort-house to supply the charging machines with coal.

COKE MACHINERY.

Fixed underneath the stage-flooring, and close to the retort-benches, are shoots, which allow the coke drawn from the retorts to fall into coke-bogies. These bogies travel on lines fixed on the ground floor, and convey the coke to the elevator by means of compressed air motors. The coke is conveyed to a screening plant, and then passes into different bunkers of the overhead hopper, which holds 100 tons of this material.

ELECTRIC TELPHER.

This plant removes all the coke made by the vertical retorts and distributes it to the boilers, carburetted water-gas plant, railway wagons, and the coke-hoppers. In case of emergency, the plant can also remove the whole of the coke made by the horizontal retorts.

CARBURETTED WATER GAS.

In connection with the manufacture of gas, there are three complete sets of Humphreys and Glasgow's carburetted water-gas apparatus.

ENGINE-HOUSE.

The engine-house is 50 ft. square. In this are installed two gas-exhausters and two steam-turbine blowers used in connection with the carburetted water gas, three coal-gas exhausters and engines, two gas-engines and dynamo for generating electricity for the use of the telpher and elevator, and one compressor for compressing air for the use of the charging and drawing machines and coke trucks.

BOILERS.

The boiler-house contains four boilers. These work at a pressure of 100 lbs. per square inch. They are fitted with Wilton's forced draught furnaces.

LABORATORIES.

There is a photometer room, chemical and physical laboratory, and complete coal-gas testing plant. The laboratories are fitted for the testing of all materials employed in connection with the works, also for the testing of gas, bye-products, gas-fires, cookers, &c. The Eastbank Street rooms are fitted for the repairing and cleaning of stoves, meters, lamps, &c., and at the showroom there are exhibited appliances for cooking, lighting, &c., the uses of which are demonstrated to the public.

STREET LIGHTING.

The greater portion of the streets are lit by incandescent gas-lamps. There are also a number of lamps installed for shops and for street lighting of the high-pressure system.

At the conclusion of the inspection the visitors assembled in the laboratories, where Mr. Bond gave a demonstration with the apparatus used for testing the radiant heat from gas-fires. Mr. Clarke (representing the Cambridge Scientific Instrument Company) gave further demonstrations with scientific instruments, explaining their uses and application to gas-works' practice.

TEA AND SOME SPEECHES.

The party were then conveyed by motor char-à-banc to a café in the town and entertained to tea which was presided over by Mr. Wright, the Mayor of Southport, who extended to the Association a very hearty welcome to the town, and hoped that this would not be the last time they would have the pleasure of seeing them.

The PRESIDENT (Mr. Wm. Fletcher), on behalf of the Association, thanked the Mayor for his hearty welcome. He coupled with this the names of Mr. Ball and Mr. Rhodes (the Chairman and Vice-Chairman), and the members of the Gas Committee. The visitors highly appreciated the kindness of Mr. Bond. Perhaps it was the first time many of them had had the pleasure of meeting him, even though the name of Bond was a household word in the gas profession. They had visited many gas-works, but had never seen so much attention devoted to the scientific side of the industry. Many gas-works had laboratories fitted up for the investigation of works' problems; but he felt safe in saying that 70 p.ct. neglected the vital part of investigation on behalf of the consumer. It was very necessary to educate the consumer in the uses of gas, but more necessary to give him the best apparatus for the gas supplied.

Mr. DIXON (Lancaster) rose to second the vote of thanks, remarking how interested he had been in the scientific demonstration of testing gas-fires. He had been trying to bring this down to the question of £ *s. d.*; and it had occurred to him that valuable information could be obtained by repeating the radiation tests on a gas-fire after it had been in use for two years or so. Such a test, with a maintenance scheme, would enable a gas undertaking to secure the efficiency of a gas-fire even if there should have been a reduction. He was gratified with the attendance, which was a criterion of the interest the Junior Association had in their work, He attended meetings of the Senior Association, but the criticism or remarks were often to justify the results obtained; the Juniors, however, discussed the difficulties in working. It was the Junior who came into actual contact with, and had to overcome, these difficulties.

Mr. BALL said they were proud of the efficiency of their works, and honoured in having such an excellent Gas Engineer and Manager as Mr. Bond, who had a universal reputation. He himself took a deep interest in the industry, being a trained chemist. The industry was one where scientific knowledge was very desirable. He considered the outlook very bright and cheerful, and there was no reason why they should take a second place in light, heat, or power distribution.

Mr. BOND also replied to the vote of thanks, and hoped that they would devote more attention to the scientific side of the industry. During the war they had been engaged on many investigations for the Government, and if it had not been for the work done by the gas industry, the war would not have been so successfully propagated. They were now shaking off the dust of the war, but were unfortunately compelled to work under many difficulties, particularly regarding coal. Some undertakings were receiving coal with as much as 30 p.ct. of ash content. The Coal Controller was sending other gas undertakings steam fuel; and gas-making coal was being sent to the electricity works. With regard to the remarks as to the testing of gas-fires, the investigation had been conducted with a view of giving a lead to manufacturers of gas-stoves to produce apparatus which would give satisfactory results. The experiments had been successful so far as gas-fires were concerned; and he hoped to extend the investigation in the near future to gas-cookers. The Leeds University, under the guidance of Prof. Smithells for the Research Committee on Carbonization, had secured a make of gas per ton of 33,000 c.ft. from a coal which, under the ordinary method of working, had only given a yield of 10,000 to 11,000 c.ft. He was sure that research was very essential—in fact, the *crux* of the whole matter. The gas industry had a bright future, and with the help of the Junior Associations they need fear no one.

ALTERATION OF RULE.

A special meeting of the Association was then held; and in accordance with a notice of motion it was unanimously resolved that Rule 6 be altered as follows: "The subscription shall be 11s. per annum (inclusive of a copy of the Joint 'Transactions'), payable in advance to the Treasurer—the year to commence with the annual meeting."

SCOTTISH JUNIOR GAS ASSOCIATION.

(EASTERN DISTRICT.)

Opening Meeting of the Session.

The Scottish Junior Gas Association (Eastern District) held their first quarterly meeting of the session at Perth, on Saturday, Dec. 6.

VISIT TO THE PERTH GAS-WORKS.

Previous to the meeting, the members met at the show-rooms of the Perth Corporation Gas Department, in Charles Street, where they were received by Mr. David Vass, the Gas Engineer and Manager.

Mr. Vass and his assistants conducted the party over the workshops, where much interest was shown in the cooker-cleaning arrangements, and the method of re-tinning cooker grill-pans, drip pans, &c. After cleaning in a bath containing sulphuric acid, the pans are dried and scraped before being electro-tinned. The process of tinning takes from 15 to 20 minutes; and after being polished, the pans are as good as new.

The meter-spraying apparatus also received attention. The device is one much to be commended in these days, and results in great saving in meter repairs, and lengthens the life of the meter considerably.

Adjourning from the workshops, the boosting plant at the gas-holder station was inspected. A Bryan-Donkin compressor is used to boost the gas to the outlying district of Almondband and Methven through a steel main ranging from 6 in. to 3 in. diameter. A Roots blower also supplies the Bridge of Earn through a 6 in. cast-iron main; the pressure for Bridge of Earn being governed at the holder station, so as to give a working pressure in the district—there being no district holder at Bridge of Earn.

The members were entertained to tea by the generosity of the Perth Corporation.

Mr. VASS (later) delivered the address, upon "Purification," which will be found on p. 550 of last week's "JOURNAL."

DISCUSSION.

Mr. DEARDEN (Dunfermline) asked what was the percentage of O_2 in the gas supplied to the district, after the 1½ p.ct. of O_2 had been admitted to the purifiers.

Mr. JAMES D. LUCK (Monifieth) said he was in the unfortunate position at Monifieth that on his purifiers there was a hydraulic valve with which it was not possible to work the backward process. He worked in the usual way with three on and one off; but he could not change the course of the gas at all. He hoped, however, to have a Weck's valve fitted in a short time, and meant to try the process mentioned by Mr. Vass.

Mr. IRELAND (Carnoustie) said he had worked the backward rotation on his purifiers for some considerable time, and found it to be a success until a few months ago. He had occasion to change one of the purifiers, and on putting in new oxide found that, a short time after, the gas on the outlet was again showing a sulphur content. He tried admitting more O_2. It then worked satisfactorily, and there was no depreciation of the quality of the gas.

Mr. VASS, in replying, said in the course of his remarks that he believed that in admitting O_2 in the forward rotation, the full benefit was not derived. In the backward process the O_2 was being admitted where it could be active at a place where it would do some good. At Perth, as well as at Airdrie, he had run a set of four boxes for nearly two years without changing the oxide. The boxes at Airdrie were 16 ft. square, and purified nearly 100 million c.ft. of gas a year. The backward process was worked with much success, and certainly saved the expense of having an additional set of purifiers. In reply to Mr. Dearden, the O_2 content in the purified gas was very small (if any); but it was not easy to make daily tests. The absorbing reagent for O_2 became very quickly oxidized; and it meant practically making up a fresh solution every day. He would not like to say what was the maximum quantity of O_2 which could be admitted. He had never introduced more than an average of 2 p.ct.; but with less than 1½ p.ct. he did not think the H_2S was fully neutralized in the foul boxes. By keeping a steady flow of O_2, the N_2 contents were kept constant, which was much more desirable than admitting almost a neglible quantity for a time and then having to increase the amount beyond 2 p.ct. He thought Mr. Luck might get over his difficulty of a suitable valve, and he demonstrated how this might be done. In reply to Mr. Ireland, he suggested that probably the new oxide box was too acid. By by-passing the gas for a short time to allow the ammonia to alkaline the new box, the difficulty would, he thought, be overcome. He was also in favour of trying a layer of lime in each purifier box, which would do much to completely eliminate the CS_2.

VOTES OF THANKS.

The PRESIDENT (Mr. L. Farquhar) said that the Juniors were indeed fortunate in having Mr. Vass to address them that day. He wanted to thank him in the name of the Association for his valuable paper, and also for the kind way in which he had made the afternoon so successful and interesting. He also asked the members to accord a hearty vote of thanks to the Perth Corporation for their hospitality.

Mr. HUNTER, the Convener of the Perth Gas Committee, replying to the vote of thanks, said he would have been glad if other members of the Town Council had been present. They would have been inclined to take a different view of the difficulties with which those in the gas industry were confronted, and consequently arrive at a greater estimate of the quality and quantity of the work required of them. He had only lately been appointed Convener, and as yet knew very little of the operations of a gas-works; but by the experience he had had so far, he had no doubt, with such an expert as Mr. Vass at the helm, they would surmount all difficulties.

SCOTTISH JUNIOR GAS ASSOCIATION.

(WESTERN DISTRICT.)

Visit to the Dunbreck Coke-Ovens.

About sixty members of the Western District of the Scottish Junior Gas Association visited Messrs. Baird & Co.'s Coke-Ovens at Dunbreck on Saturday last. The visitors were received by Mr. Alex. T. Martin (the Manager), who, along with his assistants, conducted them over the plant, and explained the details of the "Semet-Solvay" system—that employed at Dunbreck.

The installation consists of six benches of 25 ovens (150 ovens in all), each 30 ft. long by 17 in. tapered to 15 in. wide by 6 ft. high, capable of carbonizing 650 tons of coal per day, and producing 470 tons of coke. The dross used comes from seven local pits belonging to Messrs. Baird. On its arrival at the works, it is washed and crushed, and then elevated to a storage bunker with a capacity for 1400 tons. Two methods of charging and discharging the ovens are in use. In the one case, three benches or 75 ovens are charged at the front of the ovens by an electric charging and discharging machine, which travels along the whole section. The finely-crushed dross is conveyed from the storage bunker by means of a rubber and canvas belt conveyor about 800 ft. long, which deals with some 4½ tons in ten minutes, to the charging "peel," which is filled from a side shoot. As the fine dross runs into the peel, it is compressed firmly by beaters into a coke weighing about 4½ tons, which represents a charge. The charging and discharging machine is then driven up to the oven; and the carbonized charge having been pushed out, the peel with the fresh charge is slowly moved into the oven. On the oven door being lowered, the peel is drawn out. The carbonized charge falls on a sloping platform of cast-iron plates. As it comes out of the oven, the coke is quenched by water, which is played on it from the top of the bench and from the ground level. At the bottom of this sloping platform runs a conveyor, which carries the coke to a screening plant, where the large and small coke are separated, and then delivered into railway wagons.

The other three benches of 75 ovens are charged from the top. Instead of a belt conveyor, small steel bogies convey the finely-crushed dross to the ovens. There are three light rail-tracks on the top of the benches upon which the bogies run. At each oven between each set of rails, there are filling holes or doors for charging the ovens. When the ovens are being charged, the bogies are drawn up over the holes, and their contents discharged through bottom doors, into the ovens. The charge is levelled by hand by two men (one on each side of the oven), who operate clots through ports in the oven doors. The method of discharging and the treatment of the coke is similar to that already described. Instead of an electrically driven charging and discharging machine, however, a steam pusher, which travels the length of the three benches, is employed. The duration of each charge is about 24 hours; and the temperature maintained in the ovens is about 1100° Fahr.

Mr. Martin explained that there were permanent division walls between each pair of ovens, and that when repairs were being carried out the ovens adjoining the one being repaired were not disturbed. It was observed that the coke, in the form of a solid cake, when being pushed out of the ovens showed a dividing line in the centre, and had the appearance of being in two equal pieces. Mr. Martin stated that this was caused by the side heating which was employed. It was often found that if the heats were greater at one side of the oven, this dividing line did not appear in the centre, but was nearer one side than the other.

The waste gases from the ovens heat fifteen Lancashire boilers, which supply steam to the whole works. The gas from each oven is taken off by an uptake pipe (each oven has its own off-take), which leads into a hydraulic main about 3 ft. 6 in. in diameter running the full length on one side of the benches. From this it passes to the foul main, and then to the condensers. An 8 in. main for carrying the purified gas for heating the settings runs along the top of the benches.

The condensers in use are of the atmospheric and water-cooled types. The gas as it leaves the condensers is at a temperature of about 80° Fahr.

In the exhauster-house there are three Bryan-Donkin and six Waller type exhausters (three of these are spares). Each exhauster deals with the gas from one bench of ovens, which equals about a million c.ft. per day.

There are six liquor scrubbers, working in pairs, with one washer to each pair; and each pair deals with the output of two benches of ovens. In addition there are six benzol scrubbers, which operate in the same manner as the liquor ones. Each scrubber has its own circulating pump; there being twelve pumps for the scrubbing plant.

About 2200 gallons of crude benzol are produced per day. The washed benzol recovered equals about 1500 gallons.

Tar distillation is carried out in four intermittent and one Hird continuous tar-distilling plant. The sulphate of ammonia plant produces about 9 tons per day.

A VOTE OF THANKS.

At the conclusion of the inspection, the visitors were entertained at tea.

The PRESIDENT (Mr. James Dickson), on behalf of the members,

thanked Messrs. Baird for the privilege given them of inspecting the plant and for their hospitality, and also thanked Mr. Martin and his assistants for the very interesting description given by them of the various parts of the works.

Mr. MARTIN, in reply, expressed his pleasure in having a visit from the Association, and hoped the members had seen something which would be of value to them. He was sorry that Mr. Buchanan, their General Manager, had not been able to be present.

A NEW HEATING VALUE INDICATOR.

Among the papers presented at the first annual meeting of the new American Gas Association was one by Mr. Edward J. Brady, of Philadelphia, who gave an account of the origin and development of a new instrument for determining the heating value of certain illuminating gases. By means of this instrument, a determination of the heating value may be made in a few minutes with an accuracy of between 1 and 2 p.ct., and it may be made by a person having very little (if any) calorimetric experience. The author did not suggest that it may take the place of any of the standard flow calorimeters now in use. The standard flow calorimeter is definitive in its conception; and whenever a question arises as to the heating value of a gas for legal or other purposes of importance, its use must be resorted to. It is, however, he said unfortunate that hitherto the gas industry has had no instrument of intermediate cost and precision—one that could be operated with a reasonable degree of accuracy by the average assistant about a gas-works. This necessitated installing an expensive calorimeter equipment, capable of the highest precision, in order to make heating value determinations where an accuracy of the order of 1 or 2 p.ct. would answer very many purposes. Such an equipment requires, not only some intelligence, but also considerable experience, on the part of the operator, if all the necessaay corrections and observations are to be made. When the proper conditions are not maintained, and some of the corrections are neglected, it is possible, even with an expensive outfit, to drift into errors of considerable magnitude.

BUNSEN FLAME CHARACTERISTICS.

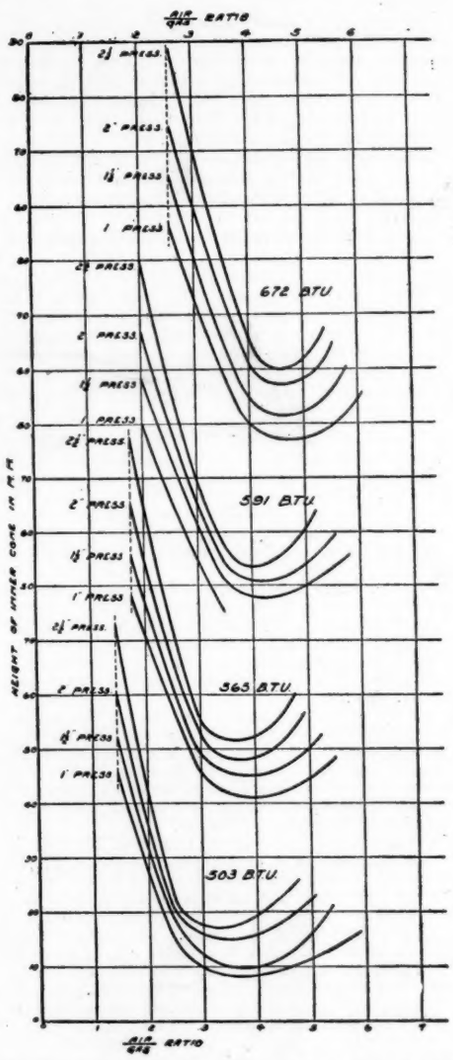
If illuminating gas is burned in a bunsen burner in which the primary air is under control, and at the base of which no primary air is admitted, we get an ordinary wavering yellow flame disturbed by the slightest zephyr, and having no character whatsoever. If we now gradually admit more air at the base, the flame becomes smaller, and the yellow becomes less pronounced. Additional air will reduce the luminous portion to a mere yellow tip that surrounds the inner blue cone of the flame. From this point on, with an increasing amount of air, the whole flame, but more especially the inner blue cone, becomes steady, and takes on a more and more definite shape. The inner cone becomes rapidly shorter, and the outer cone also decreases in height, but less rapidly than does the inner blue cone. As the air is still further increased, a ratio is reached where the height of the inner cone is a minimum, and the flame begins to increase again until the so-called blow-off point is reached. This occurs when the velocity of the issuing mixture exceeds its velocity of inflammation. This latter velocity is greatly reduced by the excess air. As the flame passes the minimum height, it takes on an entirely different appearance. The greenish hue changes to a faint blue, and the outer flame becomes less prominent, until it finally disappears shortly before the blow-off point is reached. If the burner is of suitable desigu, with a large mixing chamber and all the possible variables under complete control, a bunsen flame is reproducible to a surprising degree of accuracy.

There follows from this the possibility of determining the relations among the numerous variables that enter to cause a change in the shape and size of the flame. These are, in the order of their probable effect upon the dimensions of the flame, as follows: (1) Ratio of air to gas in the primary mixture; (2) heating value of the gas; (3) specific gravity of the gas; (4) pressure of the gas at the orifice; (5) temperature of the mixture; (6) barometric pressure; (7) humidity of the atmosphere. The effects of the foregoing variables on the size and shape of the bunsen flame were studied.

The author gives a description of the apparatus employed for determining the bunsen flame characteristics; and a series of diagrams show some results of the work. These led to the construction of an instrument for the desired purpose; but since the necessary conditions for maintaining constant all the variables were so exacting, it was abandoned in favour of the instrument to be described, which is based upon the disappearance of the yellow tip from the flame.

THE "YELLOW-TIP" RATIO.

Many of the relations between the variables involved were, said Mr. Brady, determined. Only one relation, however, will be dwelt upon in detail at this time, since it is the one that forms the basis on which the instrument is based. This is the relation between the heating value of the gas and the air-gas ratio at the point where the yellow tip in the flame just disappears. In fig. 1, the four groups of curves should be noted. They all represent the relation between the height of the inner cone and the air-gas ratio at the pressure indicated. Each set of four was determined, using a stored sample of gas of the heating value indicated. By grouping these curves, it will be noted that for any particular gas the upper ends of the four curves terminate upon a straight vertical line parallel with the axis, indicating a definite value in the air-gas ratio. The upper ends of all these curves correspond with the appearance of the yellow tip, beyond which the height of the inner cone loses its significance and cannot be measured. This point of appearance is independent of the pressure, and therefore of the size of the flame. The same is true of gases of different heating value; but it should be noted that, as the gases increase in heating value, the vertical line representing the disappearance of the yellow tip, moves out further and further on the air-gas ratio axis. This would at once indicate that there is some relation between the air-gas ratio at this point and the heating value of the gas.



Bunsen flame characteristics. The curves of four gases placed in juxtaposition to show the progressive increase of air-gas ratio (at yellow tip) with heating value.

Fig. 1.

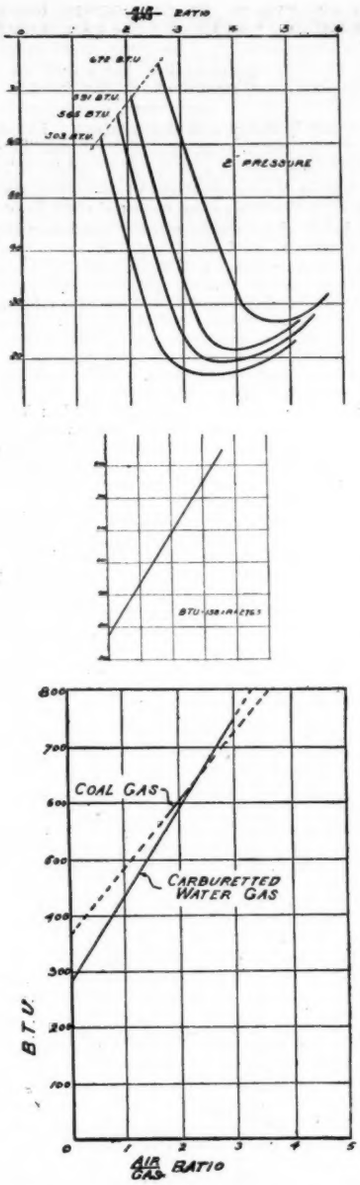
To bring this out more clearly, in fig. 2 have been grouped four gases all differing in heating value, but all at 2 in. pressure. In this group each line represents the relation between the height of the inner cone and the air-gas ratio. Observing the upper ends of these curves, which correspond, as before, with the appearance of the yellow tip, it will be noted that the relation between its appearance (or disappearance) and the heating value of the gas appears to be a straight line, as shown by the dotted line passing through their ends.

All the foregoing work was done for a purpose quite aside from determining the relation between the heating value and the disappearance of the yellow tip. The work was therefore repeated, paying particular attention to the disappearance of the yellow tip, neglecting the height and other characteristics of the flame, and covering a greater range of heating values—that is, from 305 to approximately 700 B.Th.U.

The relation was found to be as shown in fig. 3. It is represented quite accurately by the formula:

$$B.Th.U = K_1R + K_2.$$

It may not be true that the value of these constants will be the same for carburetted water gas made under entirely different conditions of manufacture. For all the carburetted water gases



Bunsen flame characteristics. The air-gas ratio (at the disappearance of the yellow tip) plotted as a function of heating value. For coal and carburetted water gas.

Figs. 2, 3, 4.

experimented with, however, the relation holds, and the equation becomes:

$$B.Th.U. = (158 \times R) + 276{\cdot}5,$$

where R is the value of the air-gas ratio at the point of disappearance of the yellow tip. It will be noted that the intercept represented by the constant 276·5 is approximately the heating value of the non-luminous constituents of the gas.

Fig. 4 shows this relation plotted for both carburetted water gas and coal gas. The values of the constants for coal gas are somewhat different from those of water gas, the relation being:

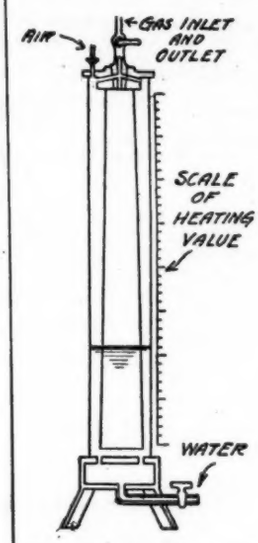
$$B.Th.U = 125\ R + 351.$$

As the range of heating values obtainable with coal gas is very narrow compared with that of water gas, the slope of its graph cannot be so accurately determined. The range of both gases is shown by the full part of the lines.

Some little thought was given to the exact criterion of disappearance. As the amount of yellow at the tip of the inner cone becomes less and less, the blue of the lower cone gradually goes up the sides and unites at the top, forming a little arch of blue. This may, and usually does, occur slightly before the disappearance of all the yellow. It was the appearance at the moment when the blue unites at the top of the flame which was chosen as the criterion.

Description of the Instrument.

The instrument for making practical use of this relation is quite simple and compact. Fig. 5 shows a diagrammatic cross section. Briefly, it consists of a 3 in. diameter glass tube, having a connection at the bottom for water. From the connection, a rubber tube runs to an aspirator vessel that may be raised or lowered in the usual manner. The interior of the glass tube is divided into two spaces by a light metal tube fastened at the top, and of varying diameter; it being larger at the bottom than it is at the top. The annular space is for air, and the centre circular space is for the gas. Both are drawn in at the top, the cock being set so that they do not communicate. After filling, the opening to the air is closed and the cock turned so that the air and gas can communicate through comparatively large passages; and they are both expelled as a mixture through a small mixing chamber, and thence to the burner. The issuing mixture is ignited, and the flame watched very carefully. The flame burns with a continually increasing ratio of air to gas, due to the changing diameter of the inner tube as the water ascends. As the yellow tip becomes smaller, and finally disappears, according to the criterion described above, the water flow is quickly stopped by the cock at the bottom. The water level in the instrument is then read off the scale, and its elevation is a measure of the heating value—approximately $\frac{1}{16}$ in. equalling 1 B.Th.U. The scale may be in arbitrary divisions, or it may be graduated in B.Th.U.



Sketch of the new heating value indicator.

Fig. 5.

The scale will be attached to the instrument on the side; and it may be adjusted to take care of any differences that may arise, caused by the glass tubes varying in diameter or differences in manufacturing conditions.

A standard procedure as to the rate of flow of water, height of aspirator above the instrument, and the manipulation in general is desirable, and will be decided upon. Both the air and gas are in contact with the same water. They should, therefore, have the same temperature and degree of saturation. No humidity correction need be applied. The yellow tip is in the centre of the flame, and the humidity condition of the secondary air appears to have not the slightest effect upon the readings.

Some Actual Determinations.

The precision of the instrument is limited to the photometric precision connected with the observance of the flame. With some experience and on a stored sample of gas, one can stop the water within $\frac{1}{2}$ of an inch of the same point each time, This would be approximately equal to 2 B.Th.U. on a B.Th.U. scale. Such accuracy, however, is not to be expected in practice; and the accuracy mentioned at the beginning—viz., between 1 and 2 p.ct. —is thought to represent more nearly the accuracy obtainable in practice.

Meter-Repair Shop Re-Arrangement in Baltimore.

The scheme planned and carried out by Mr. H. M. Riley for the re-arrangement of the meter-repair shops of the Consolidated Gas, Electric Light, and Power Company of Baltimore, is very fully described by him (with the aid of numerous sketches) in the "American Gas Engineering Journal." His first step was to make a study of the various operations to which each class of meters was subject; and he at the same time endeavoured to visualize to a certain extent the different classes of meters, and the reasons for their being so classified. Further, a graphic representation of the various operations on the different kinds of meters was drawn up; and after a study of this, a large-scale plan was drawn of the meter-repair shop. With this drawing in hand, the next step consisted in cutting out fairly heavy cardboard plan models of the different benches, machine tools, &c. These models were made to the proper scale, and could be readily moved about and attached to the large drawing of the meter-shop, which had been mounted on a board. The meter records were looked up for the previous five years, so as to obtain an average percentage of each class of meters sent through the repair shop —new diaphragm adjustment, valves ground, oiled diaphragm, and "O.K." meters. After all the models had been placed, the paths of all the five classes of meters were carefully measured, and an inspection of the plan made for any duplication of travel, &c. The cardboard models were then arranged in a different manner, and the same procedure gone through. This was done three times, after which it was apparent that no further trials were necessary. Finally the second layout was adopted, and the shop changed accordingly. The original scheme showed much duplication of travel—so much so, indeed, that the re-arrangement of the repair shop (notwithstanding the fact that under the new scheme the shop includes a greater area) results in a saving, on the basis of 25,000 meters a year, amounting to 826 miles.

The late Prof. A. G. Vernon-Harcourt, who died at the age of 84, left unsettled estate of the gross value of £17,168.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Are our Gas Appliance Makers behind the Times?

SIR,—With reference to the above correspondence, herewith please find copy of a letter sent in reply to last week's letter of the Clark Syphon Stove Company, which I think will be self-explanatory.

WM. ARMITAGE DRAKE.

Dalemore, Halifax, Dec. 12, 1919.

[ENCLOSURE.]

This consists of a letter from Mr. Drake, addressed to the Richmond Gas Stove and Meter Company, in which he suggests an appointment for a representative of the firm to call upon him for the purpose of clearing-up all doubts on the points raised in the letter published in the "JOURNAL" last week, and proving to his satisfaction that the appliance in question is not an isolated instance.

Mr. Drake continues: Within the last month or two the Halifax Gas Department have had and sold one with an exactly similarly constructed injector; so convincing me that ours—purchased and used both before, during, and since the war, with all the various qualities of gas supplied throughout that time—is typical. It was never a success as supplied. Furthermore the Gas Department did not succeed in making it so, probably due to an unwillingness to interfere drastically with its construction, as I had no hesitation in doing in my determination to end it one way or the other.

Our gas supply is not usually noted as so rich as to require specially large primary-air intakes in appliances using it; and although open to its fullest capacity, that in question was too small—whether due to faulty design or moulding I am unable to say. I am convinced that this particular iron could not have been tested with any average quality of town's gas.

I have had considerable experience in the regulation of many gas appliances, and can assure you I have no wish to do any injustice to an efficient article. Nor have I any "axe to grind," as I am not interested in any firm of appliance makers, but have at heart the interests of the industry as a whole, with a desire to remove causes for medical men to lay charges of carbon monoxide poisoning, as has been done on account of faulty appliances of ancient make.

Whether the iron has or has not now an economical "Méker" flame, it is certainly not a "reeker;" and economy is not the first consideration. "Safety-first," then efficiency and economy, should be the order of the day.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official List" for Dec. 10.]

Nos. 29,848—30,615.

AIRD, K.—"Gas-fires." No. 30,467.
BARNES, J. H.—"Incandescent gas-mantle box." No. 30,561.
BROOK, S.—"Gas-taps, &c." No. 30,060.
CARPENTER, C. C.—"Collection of gases in chambers." No. 30,243.
CHEMICAL ENGINEERING & WILTON'S PATENT FURNACE COMPANY.—"Liquid-fuel burners." No. 30,610.
COSSINS, H. F.—"Utilization of gas for the propulsion of boats, vehicles, &c." No. 30,189.
CROOKE, W. R.—"Water-heaters for gas-stoves, &c." No. 30,378.
ECK, J.—See Brook. No. 30,060.
GRICE, T.—"Attachment for the front of gas-fires." No. 30,072.
HUMPHREY, G. E.—"Gas-fitting." No. 30,429.
KENT, W. G.—"Means for controlling flow of liquids in conduits." No. 30,598.
LANGFORD, H. H.—"Adjustable gas-ring and stand for boilers." No. 30,187.
LANGFORD, H. H.—"Safety tap for gas." No. 30,188.
LAVENDER, W. S.—"Device for use with gas, &c., burners for radiating or directing the heat." No. 29,891.
LOWE, J.—"Plant for manufacture of blue water gas in conjunction with coal gas." No. 30,117.
LUCAS, F. L.—"Mixers and burners for air and gas." No. 30,360.
MACFARLANE, A.—"Attachments for incandescent gas-burners." No. 29,894.
MITCHELL, F. A.—"Cocks to prevent use of gas." No. 30,533.
MOHR, G. G. G.—"Gas-fire lighter for stoves, &c." No. 30,079.
OSBALDISTON, J.—"Incandescent burners." No. 30,578.
RICHARDS, P. D.—See Langford. Nos. 30,187, 30,188.
SCOTT, H. B.—"Bye-pass valve." No. 29,922.
SLOMAN, J.—"Economizer for inverted gas-mantles." No. 30,591.
SMITH, H. E.—"Gas-cooking stoves." No. 30,244.
SMITH, T. B.—"Apparatus for gasification of volatile hydrocarbons and liquid and liquefiable fuel." No. 30,426.
SMITH'S DOCK COMPANY.—See Scott. No. 29,922.
SPENSERS, LTD.—See Smith. No. 30,244.
VALENTINE, H. S.—"Gas or atmospheric burners." No. 30,022.
WADE, F. R.—"Means for mending or stopping burst pipes." No. 30,581.
WEBSTER, A.—"Frictional device for lighting burners, &c." No. 30,005.
WEBSTER, S. A. D.—"Gas-fires." No. 30,467.
WILSON, C.—"Gas stoves and heaters." No. 30,276.

The Monte Video Gas and Dry Dock Company, Limited, notify that the transfer books of the 5 p.ct. perpetual first mortgage debenture stock will be closed from Dec. 18 to Dec. 31 inclusive, for the preparation of the interest warrants payable on Jan. 1.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

The Gas Industry and the Electricity Supply Bill.

In the course of the adjourned debate on the Electricity Supply Bil in the House of Lords yesterday week, there were (although the measure was given a second reading) only two speakers in favour of the measure—Lord Haldane and the Lord Chancellor. All others were opposed. At the opening of the discussion the previous week, save for the speech of the Lord Chancellor, those who addressed the House were also antagonistic to the policy of the Bill, as well as to the financial obligations to which it commits the country. It was on this occasion that Lord Moulton delivered the speech to which allusion was made in our editorial columns last week. There were on the second occasion some references to the attitude of the gas industry to the Bill, as well as to the position of the industry in respect of the general question of coal conservation. Without traversing the whole of the debate, we extract these references.

Lord HALDANE made the following remarks: With great super-generating stations it is possible to erect works for obtaining the bye-products in a very different fashion from that which obtains to-day. You may produce your coke at less cost, and secure a number of bye-products which we lose to-day. You would also be able to produce gas. One of the reproaches against the Bill is that it does not take account of the gas industry. It is a great mistake. Nobody desires to hurt this industry; nor does anybody think that the principle of the Bill, even if carried into operation, would injure the gas industry. Gas is produced in a costly fashion at the moment; we have not adopted the principle of generating gas at large generating stations and sending it at high pressure long distances, which obtains in Canada and other parts of His Majesty's dominions. I think that I have said enough to show that the gas problem was not left out of account, both in respect of the production of gas proper and in respect of bye-products, which are a very great source of revenue if you can obtain them in their full variety and quantity.

The consumer is the most important person with whom we are concerned, because, unless the consumer is able to get motive power for his works, and light and heat for his house, on a reasonable scale, it is useless for us to talk of the conditions of this country in regard to production as being conditions we are in earnest in trying to set right.

If heat could be furnished by electricity, not merely for power but for domestic use, and if gas could be furnished at high pressure and on improved principles in the way that I have been suggesting, then the private householder would be very much better off then he is at the present time.

It is not merely industrial power—though I think that is most important—but it is the better conditions for the household—conditions the extension of which we cannot yet see, but which will be great as soon as the matter becomes a practical one.

Lord EMMOTT, in the course of a very informative speech, referred to the report of the Coal Conservation Committee, and quoted the following sentence:

> A possible saving in coal consumption is expected for domestic purposes (the consumption for which purpose is now probably 35,000,000 tons per annum).

In regard to this matter he said: I believe it is a generally admitted fact that open fires give only 25 p.ct. of the real heat value of coal, and that gas-fires give 50 p.ct., and that from coal there might be subtracted, in the form of gas and coke, as much as 75 p.ct. of the original heat of the coal. But the highest claim made for electricity does not exceed 12 or 13 p.ct., and the coal average given of electrical supply at the present time in heat is not above 7 or 8 p.ct. Therefore, instead of being able to save by supplying electricity for domestic heat we should make an enormous loss. We should add to our consumption 35,000,000 tons of coal for this purpose, and make (say) something like 70,000,000 or 90,000,000; so I think part of the 100,000,000 is already gone under that head.

The discussion is commented on in our editorial columns to-day.

HOUSE OF COMMONS.

Gas and Electric Undertakings and Coal Prices.

Mr. SWAN asked the President of the Board of Trade whether he would pay compensation to gas and electric lighting undertakings which held stocks of coal purchased before the 10s. reduction in price, in order to enable them to make an immediate reduction in their charges for gas and electricity supplied for household purposes.

Sir A. GEDDES replied that he feared that it was not practicable to adopt the suggestion.

Dr. MURRAY asked whether in certain areas in London the price of electricity had gone up since the reduction in the price of coal.

Sir A. GEDDES said he was aware that in certain cases, which had been decided on before the reduction in the price of coal was announced, there had been an increase; and he thought that the two cases were absolutely at one. This did not mean, however, that there would not be a reduction at the earliest possible moment.

Gas-Works and Coal Shortage.—Alderman G. Scott (the Chairman of the Gas Committee), at a meeting of the Newcastle-under-Lyme Town Council, drew attention to the serious shortage of coal; and said that, while for the moment the position was a little easier, the outlook for the future was not very promising. During the last few days four collieries had been interviewed; but they could give the Committee no assurance that the extra coal necessary for the gas-works would be obtainable. The Committee were doing all they could in the matter.

MISCELLANEOUS NEWS.

GAS PURCHASE QUESTION AT SHEFFIELD.

Parliamentary Procedure.

The Sheffield City Council met last Wednesday to consider the promotion of the Bill which has for one of its objects the purchase of the undertaking of the Sheffield Gas Company.

Alderman STYRING, moving a resolution to give the Corporation power to proceed with the Bill, said that the Parliamentary Committee had not been able to complete their inquiries with reference to the gas undertaking. They had hoped to be in a position to present a full report to the Council at this meeting; but the members who were specially added to the Parliamentary Committee for the purpose of dealing with the gas question had not obtained all the information they desired. The Town Clerk had reported that there were many important matters apart from the gas undertaking which were included in the Bill; and the Committee felt that, whether the negotiations with regard to the gas undertaking were proceeded with or not, the Bill should be dealt with in the forthcoming session. The resolution did not bind the Council to the clauses in relation to the gas undertaking. If the Council decided not to proceed with the purchase of the gas-works, these clauses would be deleted from the Bill without further question.

Mr. GRAVES remarked that at a previous meeting he understood the Town Clerk to say that in his opinion the Council were incurring enormous expenditure in connection with the parliamentary procedure on the strength of the special efforts to buy the gas business, and that if they were going to drop the gas purchase the other matters were not sufficient to justify the expense of a Bill. He should like to know how much the last Bill cost.

The TOWN CLERK said that the 1918 Bill cost slightly over £8000. With regard to the report he made to the Parliamentary Committee, what he said was that he had given notice for the promotion of a Bill next session, and he had also given notice of application for three separate Provisional Orders, for the purpose of obtaining some, but not all, of the powers which were being sought in the Bill. The reason for this was that if they ultimately decided not to proceed by Bill, they might endeavour to obtain as many of their desires as are ordinarily secured by Provisional Order. This double procedure had put the Corporation to double expense, some of which was obviously unnecessary.

The resolution was carried by 48 votes to 5, one member not voting.

SUNDERLAND GAS PURCHASE BILL DROPPED.

The Sunderland Town Council have executed another *volte face* on the proposed municipalization of the town's gas supply; for at their meeting last Wednesday they defeated a resolution to promote a Bill in Parliament to purchase the undertaking. Two months ago the Council came to a similar decision; but last month they reversed it, and the matter came up again for a formal resolution authorizing the Town Clerk to take the necessary steps to proceed. To carry this resolution an absolute majority of the Council (33 members) was necessary; but the voting was 26 against, 22 for, with 3 neutral.

Speeches against the proposed municipalization were made by Mr. F. W. Taylor and Walter Raine. Replying to Dr. Bell's charge at the last meeting, that the Gas Company had appropriated £74,000 out of surplus profits to purposes for which there was no legal sanction, Mr. Taylor explained that only £62,000 could be taken exception to, even by the most biassed critic. Of this sum, £4000 had been put on one side for compensation to workmen, £1000 for the depreciation in Consols, £1000 for bad debts, and £7000 for renewing worn-out mains. Actually £41,000 had been spent of the £62,000 in the nine years ending 1918, which was the period under review, and there was no doubt it would all have been spent, and a good deal more, but for war conditions. The whole of it had gone, or was going, in the displacement of plant which was obsolete, which, to his mind, was a wise policy, because the provision of capital expenditure out of revenue was a sound business policy, and one which Corporation departments adopted. By the improvement of the gas-works, what had been taken from the consumer had been returned with interest. There was no better illustration of this than the fact that while wages had advanced 102 p.ct. and coal 140 p.ct., the increase in price to the consumer had been only 9 p.ct. If they obtained the undertaking for £300,000, and they had to pay 8 p.ct. interest on the money—which was not exaggeration in present times—they would have to make a profit of £24,000 a year to pay their way. Such a sum had not been made by the Company for five or six years. He estimated that there would be a loss of £8000 a year. Was it worth that merely to municipalize the gas supply? If they wanted municipalization, they should have done it twenty years ago, when the gas concern was on the flood tide of its prosperity, not when the Corporation electricity undertaking was competing against it.

Mr. Raine also defended the Company's action in using the surplus profits in the way they had, and said that if they had been applied to reducing the price of gas, as opponents alleged it should have been used, it would only have meant a reduction of ¼d. per 1000 c.ft. per year over a period of 60 years. If the surplus profits had been used to reduce the price of gas, it would have been necessary to raise fresh capital from time to time, and more interest would have had to be paid. At South Shields, where only half the quantity of gas was made, it required 6·1d. per 1000 c.ft. to provide the dividends, as against 2·73d. at Sunderland; so that the consumers had benefited by the Directors' foresight.

Dr. Bell argued that as the Council had already made its decision, there should have been no discussion on the merits of the question, but that the resolution should have been formally carried. He contended that no reply had been made to the charge that the Company had used surplus profits for purposes for which there was no legal sanction, when they should have been used to reduce the price of gas. If the resolution was defeated, he warned the Council that there would have to be an inquiry into this charge of illegal appropriation of surplus profits, amounting to £118,500 in the last twelve years. He said that all the talk about the concern being worth half-a-million was absolute nonsense, and that experts had valued it at £300,000.

The resolution was defeated, as stated, and the Town Clerk announced that the Bill now dropped.

BURY (LANCS.) GAS-WORKS IMPROVEMENT.

Ministry of Health Inquiry.

An inquiry into an application by the Bury Corporation to the Ministry of Health for sanction to borrow £43,353 for the installation of vertical retorts at the gas-works, was conducted by Dr. A. W. BRIGHTMORE, last Tuesday. The original application was for £35,000 for extensions and improvements to the carbonizing plant, and was made on May 1 last. This sum was increased on June 5 to £40,000, and on Dec. 4 by £3353 more, to a total of £43,353—the amount of the tender of West's Gas Improvement Company, Ltd.

Mr. H. SIMMONDS (the Corporation Gas Engineer) said the scheme was for five beds of eight retorts, with 100 tons per day capacity. In the first year of the war, the output of gas was 418,000,000 c.ft., but last year they got down to 322,000,000 c.ft. This was due to the operation of the Daylight Saving Act and the Fuel and Lighting Order. No doubt they would soon get back to the former figure, when all the restrictions were taken off. Bury used to be one of the cheapest districts in Lancashire for gas: but, unfortunately, owing to the consumption going down, and all expenditure going up, the price had been very considerably affected. If they could have maintained the pre-war rate of output, the present price of gas would have been much lower. They were now sending out 1,800,000 c.ft. of gas per day. In 1914, a stoker cost £109 per annum; whereas to-day each stoker cost £240, and the men were asking for another 10s. per week. If the stokers got another 5s., the same as the engineers, it would make a stoker's pay £258 a year. They were also asking for double time on Sundays; and if this were granted, it would mean another £16 a year. He mentioned these matters to show the desirability of having a plant to save labour, and (by steaming) to reduce the consumption of coal. They were hoping, by means of the new plant, to save 10,000 tons of coal per annum, which, again, would mean a saving in other parts of the works, as there would be less for labour and less wear and tear on machinery. It would also mean 5000 tons less coke; and loss on this quantity of coke had been allowed for in the statement as to residuals. The coal they were getting to-day was not suitable for vertical retorts; but he had had a visit from a representative of the Coal Controller's Department, who had assured him that the Corporation would have the proper coal. On this assurance, they were going on with the scheme. It was a shame that colliery companies could fill any stuff they liked into their wagons. It affected the results all round. They could not make gas or residuals out of dirt. The only thing it made was more dirt, which had to be carted away from the works. People wondered why the price of gas had gone up. They did not realize what gas-works had had to contend with under control.

FORMBY GAS PRICES.

Urban Council Opposed to Amending Order.

At a Special Meeting of the Formby (near Southport) Urban Council on Wednesday last—the Vice-Chairman (Mr. T. E. Jones) presiding—the Clerk (Mr. E. H. Bond) reported that he had received a statutory notice from the Formby Gas Company, Ltd., under the Statutory Undertaking (Temporary Increases of Charges) Act, 1918, with reference to an application which has been made to the Board of Trade to revoke the Order so far as it affected the Company's power to charge 5s. per 1000 c.ft. of gas supplied, and to make such modifications of the Order of 1905 as shall enable the Company to charge for gas supplied an amount not exceeding 6s. 6d. per 1000 c.ft. If the Council or other parties wished to make any application to the Board of Trade, they must do so within fourteen days of the notification.

Mr. Tickle thought most of the ratepayers would feel that the Council should oppose the application. They had been paying for a number of years the maximum price of 5s. per 1000 c. ft. for gas. From the balance-sheets of the Company he gathered that they had paid dividends of 9, 8, and 6 p.ct., carrying forward a considerable balance. The Company had a monopoly. Under parliamentary powers no other gas company could come into the neighbourhood in opposition. He thought 5 or 6 p.ct. for a monopoly of this kind was quite sufficient. He admitted that wages and the cost of material had considerably increased; but there had been recently a reduction of 10s. a ton in the price of coal. He noticed in the balance-sheet that they obtained a considerable amount from coke, the price of which had also been increased. Would it not be better for the Council, if the Gas Company were willing to sell, to buy the concern at the amount at which it was capitalized? He moved that they oppose the application, and place the figures with regard to profits, &c., before the Board of Trade. Mr. Dickinson seconded.

The Clerk submitted the balance-sheets for the past three years. These showed profits as follows: 1916, £2024; 1917, £1722; and 1918, £1568. The dividends were 9, 8, and 6 p.ct. respectively; and the amounts absorbed by the dividends were £697, £600, and £427. The balances carried forward on profit and loss account were £4411, £4429, and £4450. Taking the revenue and expenditure account, it showed that in 1916 coal for production of gas cost £2633; in 1917, £3048; and in 1918, £3226. Cartage (which might also be mixed with other accounts, but dealing with it so far as it went in the one item) cost in 1916, £282; in 1917, £471; and in 1918, £574. The receipts

showed that gas sales produced £5491, £5875, and £5991. Coke brought in £981, £1216, and £1173. Gas produced for lighting and heating purposes amounted in 1916 to 27,000,000 c.ft.; 1917, 29,000,000; and 1918, nearly 27,000,000. In addition to the amount carried forward on profit and loss account in 1918, the Company had also a reserve fund of £2500. Mr. Tickle said they had to have regard to the proximity of the locality to coal mines. In this matter Formby and Wallasey—where the price of gas was 3s. per 1000 c.ft.—were about on a level; and he could not see where the case for an increase came in. Mr. Balshaw said he did not think the Company were justified in asking for an advance. They were paying good dividends, and they had about one-third of their entire capital in reserve.

The motion was carried unanimously.

SHEFFIELD GAS COMPANY'S ACCOUNTS.

Some Questions Answered.

Several members of the Sheffield Corporation having asked questions concerning the Gas Company's affairs, Mr. Watson (the Gas Auditor) has compiled information which replies to many of the points raised. Questions are printed in italics.

What were the Sheffield Gas Company assessed at in 1909, *and the amount for the year* 1919?—£41,135 7s. in 1909, and £41,769 10s. in 1919.

What is the amount of gas sold during the first six months of 1919?—2379 million cubic feet.

Have the operations of the Company during the first six months of 1919 *resulted in a loss or a profit, and how much?*—On revenue account—

Profit			£53,246 8 9
Deduct—Debenture and bank interest	£9,211 3 5		
Less—Interest from reserve fund investments	1,593 2 3		
		7,618 1 2	
			£46,628 7 7

Does any depreciation fund exist in the Company's accounts; and, if so, at what amount does it stand to-day?—No complete depreciation funds exist; but there are certain reserves for special depreciation—*e.g.*, stoking machinery and gasholders.

Does the reserve fund, stated to be £86,848, exist in the form of cash or first-class marketable securities, or does it exist as part of the general assets of the Company?—The fund is invested in Government and railway securities.

Capital employed for each year, 1910 *to* 1918, *per* 1000 *c.ft. of gas sold?*—

Year.	Capital.	Per 1000 C.Ft. Sold.
	£ s. d.	s. d.
1910	979,118 4 2	5 3·85
1911	970,633 11 2	4 10·54
1912	978,488 1 0	4 7·60
1913	992,033 9 10	4 3·56
1914	1,032,771 0 0	4 4·96
1915	1,056,382 0 0	4 3·22
1916	1,062,083 0 0	3 11·69
1917	1,071,209 0 0	3 8·31
1918	1,124,744 0 0	4 3·83

Mains: Total length laid or relaid (that is renewed)?—1899, Dec. 31, 454 miles, 1372 yards; 1919, June 30, 632 miles, 1365 yards.

Gas unaccounted for, percentage of total made, for each year, 1910 *to* 1919 (*Gas made = gas sold + gas unaccounted for*)?

Year.	Gas Made.	Gas Sold.	Gas Unaccounted for.
	Cubic Feet.	Cubic Feet.	Cubic Feet.
1910	3,812,036,000	3,679,942,400	132,093,600
1911	4,077,448,000	3,979,385,800	98,062,200
1912	4,346,269,000	4,223,354,000	122,915,000
1913	4,731,279,500	4,587,922,200	143,357,300
1914	4,902,506,000	4,679,982,500	222,523,500
1915	5,147,806,000	4,949,470,500	198,335,500
1916	5,561,175,000	5,343,994,400	217,180,600
1917	6,023,982,000	5,801,445,800	222,536,200
1918	5,369,597,860	5,207,727,760	161,870,100

Sale of gas for each year, 1910 *to* 1919, *for* (*a*) *lighting,* (*b*) *gas-engines, and* (*c*) *manufacturing?*—This information is not at present available for the full period asked for. The following particulars have been obtained from the Company:

Total Gas Sold, 1917-1918.

—	1917.	1918.
	Cubic Feet.	Cubic Feet
Domestic purpose	2,363,431,000	1,903,554,000
Gas-engines	909,411,000	860,729,000
Other purposes (industrial)	2,459,044,700	2,379,646,000
	5,731,886,700	5,143,929,000

The above are only some of the questions to which answers have been furnished. A few, the Auditor requires further time to reply to.

KEY INDUSTRIES AND IMPORT REGULATIONS.

The Government Schedule.

As was intimated in the "JOURNAL" for Nov. 25 [p. 444], in a schedule to the Imports and Exports Regulation Bill there is set out a list of the "key industries" in regard to which the measure gives powers to prohibit importation except under licence. There are two parts to the schedule; and the second (relating to thorium nitrate and gas mantles and mantle rings) is to be effective for three years only.

The "Board of Trade Journal" now explains the nature of the special key industries named in the schedule, and indicates the considerations which led to their inclusion. The references to those industries with which "JOURNAL" readers are specially concerned are reproduced.

SYNTHETIC DYESTUFFS.

The position before the war was that not only the great textile industries, but numerous other industries, were dependent to a very great extent for dyestuffs upon a group of powerful German producers, which, by a remarkable scientific and industrial organization, backed by great financial resources, dominated the world in respect of supplies of synthetic dye-stuffs. Approximately 80 p.ct. of the dyestuffs consumed in the United Kingdom were obtained from Germany; the remaining supplies coming partly from Switzerland and partly from home producers. Possession of great dye-making industries gave to Germany very considerable advantages in the conduct of the war, which was largely a war of chemists. The coal-tar products from which dyes are made are also the raw material of many high explosives. During the war, a great amount of effort was expended, with State assistance, on the development of the industry here. Substantial progress has been made, though manufacturers have been greatly hampered by lack of experience and shortage of trained chemists, and also by the difficulty of securing plant and essential raw materials. Explosives were in enormous demand, and were in direct competition with dyestuffs for plant and coal-tar derivatives. There is good reason to hope that progress will now become much more rapid, though there is, of course, an enormous amount of work to be done before the British industry can be in a position to compete upon anything like equal terms with Germany. It is essential, therefore, that it should be afforded a reasonable amount of protection.

ILLUMINATING GLASSWARE.

The importance of electric, oil, and high-pressure gas-lamps to the community for private, public, and industrial purposes is universally recognized, even if the indispensable part played by the component glassware has not been so widely realized. Before the war, except for a comparatively few electric lamp bulbs and lenses for railways and shipping, this type of glassware was obtained by importation mainly from countries recently our enemies. These sources of supply were at once rendered unavailable, while home production was negligible. Had it not been for the fact that considerable stocks were available at the outbreak of war, and that later supplies were obtainable from neutral countries, the situation, dangerous as it was, would have been even more serious. It has to be borne in mind that during the war manufacturers have had no opportunity of developing economical methods of manufacture. The fundamental consideration was that of securing supplies. Owing to the shortage of building material and labour, it has not been possible to erect new furnaces in adequate number; there was great difficulty in obtaining machinery in this country in face of the demand for munitions machinery; and the shipping situation prevented importation from America. In many cases the old existing works are quite unsuited for the introduction of modern plant and equipment, and new works will have to be built. It will be appreciated that during such time as it may take to extend and re-equip their works, and during the early stages of manufacture by new processes, manufacturers will not only be subject to overwhelming difficulties, but, if unaided, they will have to meet competition, particularly from countries which are firmly established as producers of this type of glassware.

THORIUM NITRATE.

Thorium nitrate is a salt produced by the treatment of monazite sand. An ordinary gas mantle contains 99 p.ct. of thorium oxide and 1 p.ct. of cerium oxide. Both these oxides are produced from the corresponding nitrates, and the nitrates are produced from monazite sand. Monazite sand is a very complex mineral, of which the chief deposits occur in India and Brazil. The Indian supplies, however, are much richer in thorium than are those of Brazil; and before the war the German "ring" had secured in effect control of both deposits. The process for producing the nitrates is to a very large extent secret. During the war three firms took up the manufacture—one of them at least with very marked success; and though the output is not yet equal to the country's requirements, there is every reason to hope that it will be if the trade be shielded from the crippling effects of the kind of competition that was practised before the war. The treatment of monazite sand yields also, if the bye-products be worked-up, certain other materials of great importance—particularly in the arts of war.

GAS MANTLES.

From a national point of view—and particularly in war time—gas mantles are important in that by their use an enormously increased lighting efficiency may be obtained from coal gas. Ordinary coal gas, burned in ordinary burners, gives from 3 to 5 c.p. per cubic foot. By the use of the incandescent mantle, the power may be increased to anything from 16 to 30 candles, and more, according to the pressure at which the gas is used. In war time the use of incandescent mantles for gas lighting becomes of much increased importance, because when benzol is stripped from coal gas, as had to be done in order to furnish supplies of benzol commensurate with our requirements, the candle power of the gas when burned in ordinary burners was enormously reduced, and flat-flame burners become almost useless. Notwithstanding the loss of benzol, the candle power of incandescent mantle burners is practically unaffected. Before the war, the consumption of gas

mantles in this country was not more than 70,000,000 annually. The larger portion was supplied from Germany, and that by a very close trust or ring which, in 1914, was taking active steps to compel all outsiders to fall into line with regard to prices. The ring was in a position to do this because, directly and indirectly, it controlled the world's supply of thorium nitrate.

SCHEDULE FOR TESTING METERS.

The following recommendations in connection with the testing of meters were submitted by the Consumers' Meters Committee to the annual meeting of the American Gas Association.

Capping Meters.

All meters should be capped immediately upon removal from service, and remain capped up to the time of testing. After final test, meters should remain capped until returned to service. The Committee recommend that tin caps, with a sealing-washer, be used for this purpose, and that manufacturers be requested to deliver meters similarly capped.

Time of Testing.

Meters brought into the shop for test should be placed in the test-room and allowed to remain until they have acquired the temperature of the room. Owing to the possibility of the floor being cooler than the air in the room, meters should be elevated above the floor-level. Meters should be allowed to stand at least five hours before proving, and should be tested not later than the next working day after removal from service.

Accuracy of Provers.

The consensus of opinion of the Committee is that it is not necessary to recalibrate meter provers periodically, as the experience of the members indicates that, on periodic tests, provers have very rarely been found incorrect. It is recommended, however, that in replacing present equipment, copper bells be specified. Where iron bells are repainted, care should be taken to remove the old paint, and repaired provers should be rechecked for accuracy.

Proving with Gas or Air—Advantages of Saturation.

No positive recommendation is submitted on this point, as experience has taught that the difference in using gas or air for meter proving is very slight. However, inasmuch as the meter will register gas while in active duty, the Committee believe that, if the gas can be made to serve a practical purpose after its use for proving, gas rather than air may be employed with advantage.

The question of using saturated gas for proving, being considered largely a refinement, may be left to the judgment of the individual company.

Use of Oil on Top of Water in Provers.

It was agreed that certain advantages result from the use of oil on top of the water in meter provers. The Bureau of Standards, in a Bulletin, point out the advantages and disadvantages of substituting oil for water in meter provers. It is probable that the proper selection of an oil will reduce the disadvantages to a point where they may be ignored.

Supply of Air for Proof Testing.

So long as the air is clean, and corresponds to the temperature of the proving-room, the Committee consider it immaterial whence the supply is obtained.

Check and Open Test.

Meters upon removal from service should be given a check test for recording such meter, and for use in making adjustments with consumers. For the company's own information, the open-column test should follow, and an adjustment of the meter be made, if it is found necessary, on both proofs.

Meters going into service, testing within allowable limits, should be given a small flame or slow-motion test before being placed in "O.K. stock." One revolution of the proving-head pointer should be sufficient for making tests. If open-column proof differs 1 p.ct. or more from the check proof, adjustment should be made on both check and open tests. In this case, adjust the check proof to 1 p.ct. fast or slow, or less, and the open proof to within 1 p.ct. of the check proof. If check and open proofs are not in excess of 2 p.ct. fast or slow, do not remove the top for the purpose of adjusting proofs.

Limits of Error.

Two p.ct. *plus* or *minus* is considered a reasonable limit of error on meters going into service. Any expense for readjusting a meter that has tested within 2 p.ct. of accuracy and does not require other repairs, would constitute a waste that would ultimately be paid for by the consumer. When, for any other reason, it is necessary to un-top the meter, it is recommended, however, that proofs be adjusted within 1 p.ct. of accuracy.

Reporting Proofs.

A uniform method of reporting proofs of meters, using a correction table instead of reading from a prover scale, is recommended. This will serve to make the reports of all companies available for comparison. Correction tables and instructions for using are provided by gas-meter manufacturers.

Standard Rate of Flow through Check Openings.

The Committee recommend the adoption of a schedule of check-test caps basing the rate of flow upon meter capacity instead of light size. [This schedule forms an appendix to the report.]

Reasonable Dockers at Limerick.—During last week, dock labourers on strike at Limerick refused to discharge coal which had arrived for the Corporation gas-works; and for some time it was feared the city gas supply would have to be cut off. Happily, however, the Mayor succeeded in persuading the dockers that it would help their interests to appreciate the position of the citizens generally, and they agreed to handle the coal.

THE COAL STRIKE IN AMERICA.

Rationing Order in Force.

The shortage of coal consequent upon the strike of miners in the United States led the Fuel Administrator (Mr. Garfield) last week to impose the following regulations in the matter of lighting and heating throughout the country.

All street lighting except that necessary for the safety of the public must be curtailed.

All stores, office buildings, and industrial plants, with few exceptions, are rationed both for lighting and heating.

All manufacturing plants, except those making necessary products, must reduce their operation not to exceed three days in any week.

Electric railways are required to reduce their services to a minimum; and no heat shall be provided in electric cars during the busy hours.

No ornamental or electric advertising signs or show-windows or show-case lights may be operated.

No cabaret, dance hall, billiard room, or bowling alley is permitted lights, except between 7 and 11 in the evening.

Restaurants may remain open, but must reduce their lights.

Office lights must be extinguished at 4 in the afternoon; and heating in offices and stores must not exceed 68° Fahr.

Last Thursday, the news came over that the strike was ended; the representatives of the Unions having accepted the terms proposed by President Wilson.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Dec.* 15.

The demand for pitch continues exceedingly active, although, owing to shortage of tonnage, there is difficulty in getting goods shipped. The price is firm at over 80s. per ton net in bulk at makers' works. Creosote continues in demand; the price being about 7½d. per gallon net in bulk at makers' works. Solvent naphtha is steady at about 3s. per gallon net and naked. The price of pure benzol and pure toluol is 3s. per gallon. In other products there is nothing new to report. Sulphate of ammonia remains unchanged.

Tar Products in the Provinces.

Dec. 15.

The average values for gas-works products during the week were: Gas-works coal tar, 43s. 3d. to 45s. 3d. Pitch, East Coast, 80s. to 85s. per ton f.a.s.; West Coast—Manchester, 65s. to 67s. 6d.; Liverpool, 65s. to 67s. 6d.; Clyde, 75s. to 77s. 6d. nominal. Benzol 90 p.ct., North, 1s. 8d. to 1s. 10d.; crude 65 p.ct. at 120° C., 1s. 0½d. to 1s. 1½d. naked at makers' works; 50-90 p.ct. naked, North, 1s. 8d. to 1s. 10d. Toluol, naked, North, 2s. to 2s. 1d. nominal. Coal tar crude naphtha in bulk, North, 8½d. to 9d. Solvent naphtha, naked, North, 2s. 8d. to 2s. 9d. Heavy naphtha, North, 2s. 2d. to 2s. 3d. Creosote, in bulk, North, liquid, 6d. to 6½d.; salty, 5d. to 5½d. Heavy oils, in bulk, North, 6½d. to 7d. Carbolic acid, 60 p.ct., 2s. 3d. to 2s. 4d. Naphthalene, £18 to £22; salts, £6 to £7, bags included. Anthracene, "A" quality, 7½d. to 8d. per minimum 40 p.ct.; "B" quality, nominal.

FROM A MARKET CORRESPONDENT.

Tar Products.

In spite of many uncertainties, firm conditions prevail generally in the markets for tar products, and there does not seem much likelihood of lower quotations in any direction for some time to come. Pitch remains very strong, particularly in London, where the Continental demand is as insistent as ever. In the Provinces, however, there is no very definite advance. From South Wales I hear that users are offering more money for deliveries up to June, and would probably pay 5s. more in order to secure supplies. Provincial prices generally are quite moderate compared with London. Carbolic acid is not so firm as a few days ago, although in one or two instances higher prices are still being offered. Crystals are much improved, and little can be had for delivery before March. The Government's stock is said to have been disposed of at 5½d. per lb., and probably behind the deal are some large makers who will prepare the stuff for market. The chief demand at the moment is from Japan; and if this should cease, the market would fall away. Creosote is very firm, and fuel qualities are specially favoured. Solvent naphtha is still in good demand, particularly in the Provincial centres; and prices would undoubtedly rise further but for one or two odd lots awaiting sale. When these are absorbed, prices are expected to go ahead. Benzol, despite the incentive to higher prices, is in a doubtful position. Prices for crude remain so high that it hardly pays to refine.

The range of quotations is as follows:

Benzol: 90% London 2s. to 2s. 2d., North 1s. 11d. to 2s.; 50-90% 1s. 9d. to 2s. London, 1s. 10½d. North; crude, 60-65% 1s. 5d. to 1s. 7d.; pure, 3s. per gallon naked.

Carbolic Acid: Crude 60's 2s. 4d. per gallon nominal; crystals, 40%, 10d. per lb.

Crude Tar: London, 50s. to 55s.; Midlands, 50s.; North, 50s. per ton *ex* works. Refined tar, 32s. 6d. per barrel (free) on rail.

Pitch: London, 85s. to 87s. 6d. per ton; East Coast, 72s. 6d. to 77s. 6d. per ton; West Coast, 72s. 6d. to 75s., with Manchester 72s. per ton and Glasgow 72s. per ton; South Wales, 75s. to 80s. per ton.

Solvent Naphtha: London, 3s. 3d. Provinces average 3s. 4d. per gallon.

Crude Naphtha: Naked, 9d.; North, 8½d. per gallon.

Heavy Naphtha: 2s. 6d. per gallon.

Naphthalene: Refined, £18 to £20 per ton nominal; crude, £6 10s. to £11, according to quality.

Toluol: Naked, 2s. 9d. per gallon nominal. North, 2s. 7d. Pure, 3s.

Creosote: London, 7½d.; North, 6½d. to 7d.; heavy oil, 6d. per gallon in bulk.

Anthracene: 40-45%, 9d. per unit per cwt.

Grease Oils: 18° Tw. (naked), £6 10s. per ton f.o.r. makers' works.

Aniline Oil: 1s. 3d. per lb.

Cresylic Acid: 95%, 2s. 5d. to 2s. 6d.; 97-99%, 2s. 7d. to 2s. 8d. *ex* works London, f.o.b. other ports.

Sulphate of Ammonia.

Trading continues active; the approach of the end of the year bringing in substantial late orders before the price is advanced another 7s. 6d. per ton. The increase in British consumption which was very substantial during the war, appears to be still going on; farmers evidently realizing that, unit for unit, sulphate of ammonia is the cheapest nitrogenous fertilizer on the market. Exports are not heavy, and no extension seems possible for some time, in spite of the big prices foreign buyers would pay. In the United States producers are well sold-up and record prices prevail.

Gas Running Short at Ellesmere.—On the Ellesmere Urban District Council being informed that, owing to the coal shortage, there would be only sufficient gas to light the town for 72 hours, it was decided to post notices in the district informing residents of the position.

Melbourne Gas-Workers' Strike.—As the result of a conference between the two parties, an agreement has been arrived at which ends the strike of gas workers at Melbourne. A Reuter cable states that gas workers in the State of Victoria have agreed to accept 12s. a day and reinstatement. The gas employees in Victoria came out on strike on the 5th inst. for 12s. 8d. a day (having rejected an offer of 11s. 6d. a day), which represented an increase of 6d.

Tarred Road Dangers.—At the request of the Ministry of Transport, the County Surveyors' Society have appointed a Committee to investigate the cause of the numerous complaints as to the slippery condition of certain roads surfaced with tar, tar compounds, and asphalt. Any suggestions which may be thought to be helpful to the Committee are invited, addressed to the Chief Engineer, Ministry of Transport (Roads Department), 6, Whitehall Gardens, S.W.

Increased Output at Middlesbrough.—Consideration of the matter of an emergency stand-by plant at the Middlesbrough Corporation Gas-Works has been deferred to the next meeting of the Committee. In his report on the matter, Mr. C. F. Blincoe (the Gas Manager) said the output of gas had increased to such an extent that, in the event of a total cessation in the supply of coke-oven gas, the existing carburetted water-gas plant would not produce sufficient to serve the needs of the town at any period of the year. He advised that two other sets, each with a capacity of about 1½ million c.ft. daily, should be installed as soon as circumstances permit.

Breakdown at Bingley.—Following on an inadequate coal supply to the Bingley Gas-Works, a breakdown in connection with the mechanical stoker on Friday evening resulted in the town being short of gas for lighting, there being practically no store. The matter was remedied late in the evening.

Gas Quality at Derby.—Complaints having been made at Derby regarding the poor illuminating quality of the gas, there has been some correspondence with the Gas Company; and the Markets Committee have resolved to address a letter to the Board of Trade. Embracing the opportunity thus afforded, the Electricity Committee are urging the various committees now using gas to transfer to electricity, and take the municipal supply.

Gas-Works Development at Barnoldswick.—The minutes of the Barnoldswick Gas Committee, submitted to the Urban Council last week, included one "that eight vertical retorts be added to the existing gas plant, and that two horizontal retorts be renewed as soon as possible." Mr. Gardner inquired as to the present position of the gas-works, and was informed they had about 48 hours' supply of coal in hand, and that there had been an increase of 40 p.ct. in the gas consumption during the last month.

A Protest at Otley.—The Otley Gas Company propose to seek powers to increase their charges, in order to raise the dividend to shareholders from 2¾ to 3¾ p.ct. The Otley District Council are protesting, and have made representations to the Board of Trade that, while the present Otley price is 5s. per 1000 c.ft., the Yeadon Gas Company, who supply a similar area, charge only 3s. 6d. The Council contend that the Otley gas is not satisfactory to consumers, and that by more economical working the increase could be avoided.

Power Gas Corporation.—It is stated in the report of the Directors of the Power Gas Corporation for the year ended Sept. 30 that the fully-paid shares in satisfaction of the purchase price of the business and patents of Messrs. Lymn and Rambush were issued during the year, and due effect has been given to this in the balance-sheet. The accounts show a profit of £33,561, to which is added the balance brought forward £16,797, making together £50,358. The Directors have appropriated to the reserve fund £6700, and recommend a dividend at the rate of 6 p.ct. per annum, less tax, carrying forward (out of which excess profits duty will be met) £26,309.

Gassing Accidents.—Last Tuesday morning Mr. Tom Cheetham, of Denton, was found lying in a serious condition as a result of being gassed in his bedroom. It is supposed that on going to bed on Monday he left a small light burning, and during the night when the pressure was reduced the light went out. A case very similar in some respects occurred at Oldham, where Mr. Herbert Grime was found unconscious in bed. It appears that he fell asleep without turning off the gas, which was supplied through a penny-in-the-slot meter, and that during the night the supply was exhausted. The next morning money was put into the meter, with the result that gas escaped through the jet in the room while he was asleep.

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No glasses to break and nothing to clean.

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York Street-Lighting Estimates.

The Lighting Sub-Committee have reported to the Lighting Committee of the York City Council that they had had under consideration the question of street lighting, and that they had also been in negotiation with the Gas Company and the Electric Lighting Department with regard to a new scale of charges for this service. At the present time 865 gas-lamps (out of a total of 1449) are lighted, and 425 electric lamps (out of a total of 570); and there is no street lighting during three months in the summer. The Sub-Committee submit four methods of lighting, with the annual cost in each case worked out on the new scale, which is approximately 54 p.ct. in advance of pre-war prices. The totals for the four methods of lighting would be as follows: Restricted lighting for nine months, £5501; restricted lighting for twelve months, £6360; full lighting for nine months, £8813; full lighting for twelve months, £9901. The Gas Company suggest that an automatic system of lighting and extinguishing should be adopted; and they are prepared to submit a scheme whereby a considerable saving would be effected, provided the Corporation will enter into an agreement for gas lighting for a term of years. The Gas Company would bear the whole cost of conversion. The Sub-Committee recommend that the restricted lighting be adopted, with such additions as the Lighting Committee may find necessary, for nine months in the year. They adjourned the question of automatic lighting.

Dublin Slot-Meter Gas Supply.—Complaint having been made in the Dublin Press that less gas per penny was being supplied to householders through the slot-meters, as a result of readjustment following coal-price changes, it was ascertained at the office of the Alliance and Dublin Consumers' Gas Company that no steps had been taken so far to give consumers the benefit of the recent decrease in the cost of coal, and that no official notification of the decrease had been received.

Chapel Whaley and District Gas Company.—Reporting on the operations for the year ended Sept. 30, the Directors of the Company state that the revenue account shows a profit of £1594. To this has to be added the unappropriated balance of the previous year, £2014, making £3608. Against this has to be charged bank interest amounting to £334, leaving for disposal at the present time £3274. In consequence of the increased cost of coal and all other commodities used on a gas-works, including wages, it has been necessary to considerably increase the price of gas, with the result that the authorized dividend payable under the Company's Act has been reduced to 3 p.ct. The Directors therefore some time ago made application to the Board of Trade under the provisions of the Statutory Undertakings (Temporary Increase of Charges) Act, 1918, for a temporary modification of the provisions of the Company's Act, so as to enable the Company to pay a dividend at the rate of 4½ p.ct. Pending the decision of the Board of Trade, the Directors could only recommend that a dividend be paid, leaving the rate to be fixed later. It was hoped that it might be possible to do this at the ordinary general meeting to-day.

Reply to Criticism at Grimsby.

Letters from the Grimsby Gas Company and the Cleethorpes Gas Company, in reply to the Grimsby Town Council's resolution of protest as to the low pressure and poor quality of the gas supplied in the borough, were read at a meeting of the Public Lighting Committee of the Town Council last week. The Grimsby Company wrote denying that there had been a falling-off in the quality of the gas supplied, and suggested that there had been a gradual improvement for a considerable time past. Owing to circumstances over which the Company had little or no control, their gas reserve was reduced to the minimum some time back; but during the past few weeks the pressure had been almost normal. The Manager of the Cleethorpes Gas Company (Mr. E. J. Brockway) wrote that he could not quite understand the request for higher pressure for street lighting. He enclosed a district pressure chart showing that the pressure was considerably in excess of that prescribed in the Act. In reply to the complaint as to the quality of gas supplied to private consumers, Mr. Brockway said that if consumers were unable to obtain a sufficient supply of gas it was due to some defect in the apparatus or burners. Alderman Barrett remarked that he was not aware whether it was a matter of pressure or quality, but he knew the effect of burning the gas was lamentable. One obtained a blue flame and no light. Mr. Stanley (the mover of the resolution of protest) expressed himself dissatisfied with the replies received; and the Committee decided, on the suggestion of the Town Clerk (Mr. John W. Jackson), to ask the Managers of the Companies to meet a Sub-Committee on the question

Gas-Engines for Electricity Works.—The Middlesbrough Corporation have accepted a tender for the installation of two sets of combined 350 KW. gas-engines and generators at the electricity works, at £7946 for each set. They have also decided to instal a gas-producer plant at the works at an estimated cost of £400 per set. The gas-engines are to operate either on town or producer gas.

Condition of the Tralee Gas-Works.—The Tralee Urban District Council have decided to apply to the Board of Trade for permission to increase the maximum price of gas from 6s. 8d. to 8s. 4d. per 1000 c.ft. The present price is 6s. 3d. Mr. J. M. Slattery (the Chairman) said the present gas-works debit was about £3100; and the immediately available assets were stated at about £5000. Mr. O. Tough (Town Surveyor and Acting Gas Manager) reported that neither efficiency nor economy could be secured until the retorts were reconstructed and other defects in the plant made good. Mr. T. Kelleher said they were only getting 4000 c.ft. of gas per ton of coal, as against 11,000 c.ft. in pre-war days. The capital was the smallest of any gas-works in the United Kingdom; and they should ask the Board of Trade to allow them to increase it by £3000. Mr. M'Cowen observed that this would not meet the difficulty. It was arranged to discuss the financial position at a special meeting.

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Successful Assessment Appeal at Bungay.

The Bungay Gas Company have successfully appealed against the assessment of their works before the Assessment Committee of the Wangford Union. The net assessment was £152. The Company were represented by Mr. H. J. Sprake (Solicitor) and Mr. W. Methven (Manager and Secretary). Figures for 1916-17 18 were produced, showing that, after the various statutable deductions were made, the estimated ratable value of the concern was £38, £44, and (in 1918) *nil*. Mr. Methven pointed out, in answer to a member of the Committee, that though coal had gone down 10s. a ton this at present could not influence the matter for a considerable time, as the Company had six or eight weeks' stock of coal on hand; and, further, the Daylight Saving Act, high wages, and heavy cost of materials would adversely affect the Company for a very considerable period. Mr. Sprake said that if the Committee did not favourably consider the appeal, the Company would have no option but to go to Quarter Sessions. He asked for a reduction of the net assessment by two-thirds. After the Committee had consulted, the Chairman announced that they had decided to reduce the net assessment to £77.

An Irish Town in Darkness.—Owing to a strike of labourers, including those of the gas-works, the town of Nenagh (co. Tipperary) was in darkness last week, and all works where gas-engines are employed were at a standstill.

Dublin Gas Explosion.—Considerable damage was caused at Queen's Square, Brunswick Street, Dublin, last Thursday morning by an explosion due, as it proved, to a break in a gas-main. A manhole cover and iron box were hurled into the air, and a large portion of the roadway rent asunder. Nearly every window in houses in the vicinity was shattered; and in the houses some of the residents suffered from shock, though, fortunately, no one was injured. It was thought at first that the explosion might have arisen from a gas leakage at the house where, earlier the same morning, the occupant found her two young children unconscious.

Three Days' Coal Supply at Accrington.—The stock of coal which the Accrington Gas Board have in hand is so low that the General Manager (Mr. A. J. Harrison) has appealed for strict economy in consumption. He points out that he has only three days' supply. At a meeting of the Board last Thursday he explained that a stock of 1500 tons of coal at the beginning of November had been reduced to 500 tons, while the gas consumption had increased. The increased output for November was 10 million c.ft. over the corresponding period last year. An agreement was also made for the General Manager to carry out the reconstructional work to bring the department up to date. Under this agreement, his salary was fixed at £800, rising by increments of £50 to £1000, conditionally on his remaining with the Board for five years. No consultative engineer will be called in for the work.

Drogheda Gas Undertaking.—As to his report to the Drogheda Corporation on the accounts of the gas undertaking, Mr. E. P. M'Carron, B.L. (Local Government Board Auditor), says that, as submitted, they were not properly balanced, or in such a form that the balancing could be completed at the audit; and he makes various suggestions for stricter supervision. He expresses surprise, for instance, that, while three-fifths of the slot-meters are working at the old 4s. 2d. rate, instead of the 6s. rate (owing to difficulty in procuring new cogwheels), efforts have not been made to collect excess amounts.

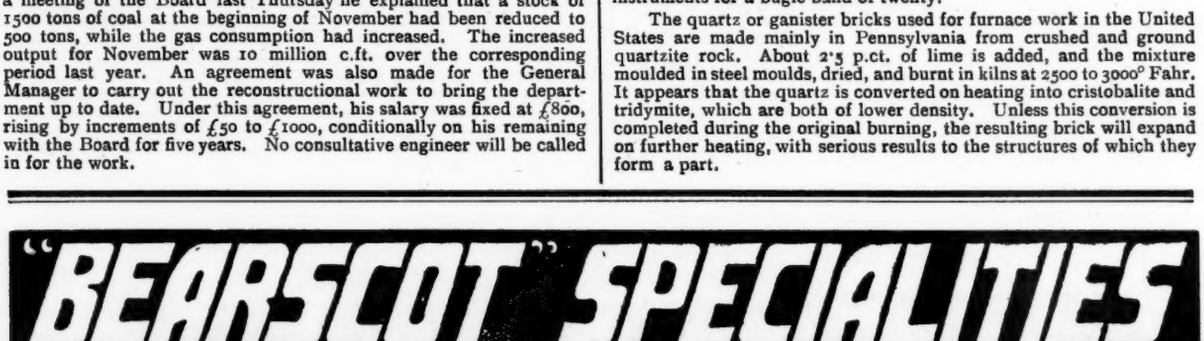
Maximum Price Inquiry at Teignmouth.—The application of the Teignmouth Urban District Council for permission to increase the maximum price of gas from 5s. to 6s. 9d. per 1000 c ft. was the subject last Thursday of a local inquiry, which was conducted by Mr. P. M. Crosthwaite, Engineering Inspector to the Ministry of Health. Objections to the increase had been made to the Ministry by two ratepayers, who were present as witnesses. The Inspector explained that he had come down to ascertain the facts as to the gas undertaking for the information of the Ministry. He would be pleased to hear any evidence; but he asked that the proceedings should be treated as private. Several witnesses were examined; and the main contention appeared to be whether the additions asked for should be borne by the consumers, or whether they should fall on the general body of ratepayers.

The Motherwell Gas Committee's recommendation has been adopted to accept the offer of Messrs. R. & J. Dempster, of Manchester, to erect a gasholder with a capacity of 1¼ million c.ft., at a cost of £33,804. This was the lowest tender.

The fifteen-year-old daughter of the caretaker of an elementary school belonging to the Midland Railway Company at Westhouses, Derbyshire, has been killed by an explosion of gas at the school. The room in which the explosion occurred was lighted by a water-slide chandelier.

The members of the Cadet Company, numbering about sixty, attached to the Devon Fortress Engineers, and employed at Messrs. Willey and Co.'s works at Exeter, were inspected last week by General Sir Charles Woolcombe, the Inspector General of Cadets, who complimented the boys upon their smart appearance and bearing. The boys were uniformed and equipped at the expense of the firm, who also provided a club room, with the necessary fittings, together with the instruments for a bugle band of twenty.

The quartz or ganister bricks used for furnace work in the United States are made mainly in Pennsylvania from crushed and ground quartzite rock. About 2·5 p.ct. of lime is added, and the mixture moulded in steel moulds, dried, and burnt in kilns at 2500 to 3000° Fahr. It appears that the quartz is converted on heating into cristobalite and tridymite, which are both of lower density. Unless this conversion is completed during the original burning, the resulting brick will expand on further heating, with serious results to the structures of which they form a part.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STOCK MARKET REPORT.

LAST week began on the Stock Exchange in very unpromising shape. Buyers were few and sellers were many; and the contagion spread until it had more or less involved most markets. But before the week was half over the plague was stayed, and thenceforward up till the close the tone steadily improved.

The gilt-edged market was rather irregular, but not a great sufferer at any period; and the final marks were better. Consols were 50⅝-50⅞, War Loan 90½-90⅝, Funding 74½-75½, and Victory 79½-80½. Home Rails were slack at first, but they soon brightened up in view of better rates. Canadians and Argentines were not strong.

The Foreign Market was for long in very bad case under pressure of sales, but later on it partially recovered—French participating in the steadiness.

In the Miscellaneous department things moved with much variation. Rubber was for some time in the cold shade of neglect, but was getting better before the close. Oils had a troubled time, what with professional manipulation and timid holders; but the well-known strong undertakings were not alarmed. As in the previous week, Mines and Textiles found friends.

Business in the Gas Market was on a reduced scale; fewer undertakings being dealt in, and fewer transactions being recorded in these. The tendency also was weaker; the downward inclination in prices which characterized the close of the preceding week making further progress. In the London Companies, Gas Light ordinary quotation was lowered 4, and that of South Metropolitan 3 points. Commercial did not move. Among the Suburban and Provincial group, some quotations were materially reviewed. Portsea "B" was put down 12½, and ditto "C" 1½, Sheffield "A" and "B" each 12, and ditto "C" 5, and South Suburban debenture 4. In Continentals, Imperial Continental fell a further 4 points, and Continental Union 2. Monte Video was put 7 lower. Other changes in quotation were almost entirely *ex div.* variations in debenture stocks.

Bargains done for cash during the week were as follows: On Monday, Gas Light ordinary 63, 64, ditto debenture 52½, 52⅝, Imperial Continental 137, 139, ditto debenture 84, Primitiva 35s., 38s. 9d., South Metropolitan 63¾, 63⅞, South Suburban 70. On Tuesday, British 25, 25⅛, Gas Light ordinary 62, 62½, 64½, ditto debenture 52¾, Imperial Continental 134, 135, 136, 137, 138, Primitiva 35s., ditto preference, 65s., South Metropolitan 62½, Tottenham "B" 52, Columbia 80, 80½. On Wednesday, Gas Light ordinary 60, 60½, Imperial Continental 134½, 135½, ditto debenture 81, Primitiva 35s., South Metropolitan 60, 61½, Tottenham "B" 53½, Truro 31½. On Thursday, Continental Union 30, 30½, Gas Light ordinary 58½, 59, 59½, 60½, ditto preference 66, Imperial Continental 133½, 134, Primitiva 35s., ditto debenture (1911) 51, South Metropolitan 60. On Friday, Alliance and Dublin 47½, Brentford "A" 55, British 26½, Commercial 4 p.ct. 57½, Gas Light ordinary 58, 58½, 58¾, 59, 60, ditto debenture 50½, 51 9/16, 51¾, 51⅞, Ilford debenture 61, Imperial Continental 133, 134½, 134⅝, 135, Monte Video 76, Portsea "B" 62, 62½, South African 12, Malta and Mediterranean first preference 42s. 6d., 43s. 1½d.

In the Money Market the available supplies continued abundant and quite adequate to meet all requirements. Discount rates were easy, but looked like becoming firmer at the close. Silver reached a new record of 78½d. The Bank rate is 6 p.ct., as fixed on Nov. 6.

ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S BARGAINS.

Issue. £	Share	When ex-Dividend.	Ante-War Dividend & Bonus p.c.	Last Dividend.	NAME.	Closing Prices, July 30, 1914	Present Prices	Lowest and Highest Prices of Bargains.
189,049	Stk.	July 31	4	4%	Aldershot 4 p.c. Pref	..	60—65	..
1,551,868	"	Sept. 26	4½	2¼%	Alliance & Dublin Ord	39—44	45 - 50	47½
874,000	"	July 11	4	4%	Do. 4 p.c. Deb.	76—79	62 - 64	
980,000	5	Oct. 30	7½	3%	Bombay, Ltd.	5½—6¾	5 - 5½	..
50,000	10	Aug. 28	16	12%	Bournemouth Gas { 10 p.c.	29—30	19—20	
883,110	10	..	7	7%	B 7 p.c.	15—15½	10—11	..
116,000	10	..	6	6/-	and Water { Pref. 6 p.c.	13½—14	9½—9⅞	..
159,740	—	June 27	—	4%	4 p.c. Deb.	..	66—67	..
992,045	Stk.	July 11	14	37/-	Brentford A Consolid.	261—266	56—61	55
784,990	..	..	11	31/8	Do. B New	204—209	52—57	..
55,000	"	..	5	5%	Do. 5 p.c. Pref.	109—111	16—74	..
231,400	"	Dec. 11	4	4%	Do. 4 p.c. Deb.	91—98	64—66*	..
214,775	"	Sept. 11	11	7½%	Brighton & Hove Orig.	208—213	123—128	..
244,200	"	—	8	5⅓%	Do. A Ord. Stk.	154—159	84—87	..
988,500	Stk.	—	5	5%	Bristol 5 p.c. max.	..	..	..
580,000	10	Sept. 26	12½	10%	British	44—48	25—27	25—26½
190,000	Stk.	June 27	4	4%	Do. 4 p.c. Deb. Stk.	88—90	63—65	..
945,771	"	..	4	4%	Buenos Aires 4 p.c. Deb.	85—87	50—53	..
100,000	10	—	—	—	CapeTown & Dis., Ltd.	1½—2½	6½—7½	..
100,000	10	Oct. 30	—	4½%	Do. 4½ p.c. Pref.	4—5	6½—7	..
100,000	Stk.	June 27	4½	4½%	Do. 4½ p.c. Deb. Stk	70—75	61—66	..
157,150	"	Feb. 26	5	5%	Chester 5 p.c. Ord.	108—110	..	..
1,518,280	"	Aug 14	5/9/4	33/4	Commercial 4 p.c. Stk.	103—108	56—61	57½
850,000	"		5½	26/8	Do. 5½ p.c. do.	103—105	52—57	..
475,000	"	Dec. 11	8	8%	Do. 8 p.c. Deb. Stk.	69½—71½	49—51*	
800,000	"	..	4	—	Continental Union Ltd	76—79	30—35	30—30½
200,000	"	..	7	—	Do. 7 p.c. Pref.	115—118	40—50	..
51,600	Stk.	Aug. 28	14½	12⅛%	Croydon A 10 p.c.	..	135—145	..
278,400	—	"	11½	9⅝%	Croydon B and C 7 p.c..	..	95—105	..
492,270	Stk.	—	6	6⅛%	Derby Con. Stk.	128—128	..	..
55,000	"	—	4	4%	Do. Deb. Stk.	102—104		..
1,002,180	10	July 30	10	5/0	European, Ltd.	17½—18	11—12	..
16,298,975	Stk.	"	4/17/4	80/-	Gas { 4 p.c. Ord.	98 - 102	58 - 61	58—64½
2,600,000	"	"	8½	26/8	Light { 8½ p.c. max.	76 - 79	44—46	..
4,062,285	"		4	4%	and { 4 p.c. Con. Pref.	96—99	65—68	66
4,674,850	"	Dec. 11	8	8%	Coke { 8 p.c. Con. Deb.	72½—74½	50—52*	50½—52½
150,000	"		10	10%	10 p.c. Bonds	..	..	..
82,500	"	Sept. 11	5	4⅓%	Hastings & St. L. 5 p.c.	..	57—62	..
958,740	"	"	8½	2⅞%	Do. 3½ p.c	87—89	40—45	..
70,000	10	April 29	11	7⅝	Hongkong & China, Ltd.	16½—16¾	8½—9½	..
86,600	Stk.	Aug. 28	9	8⅛%	Hornsey 7 p.c..	..	90—95	..
181,000	"	Sept. 11	7½	5⅜%	Ilford A and C.	151—154	88—94	..
65,780	"	"	6½	4⅝%	Do. B	115—118	67—72	..
85,500	"	June 27	4	4%	Do. 4 p.c. Deb.	92—94	61—64	61
4,940,000	"	May 14	9	4½%	Imperial Continental	150—160	133 188	133—139
1,235,000	"	Aug. 14	8½	3⅝%	Do. 8½ p.c. Deb. Red.	84—86	81 85	81—84
985,349	"	Sept. 11	6½	6½%	Lea Bridge Ord. 5 p.c.	119—121	86 -91	..
4,498,935	"	Feb. 26	10	42/6	Liverpool 5 p.c. Ord. { A B	144—145	..	..
606,083	"	June 26	4	4%	Do 4 p.c. Pr. Deb. Stk.	..		..
165,736	"	Aug. 14	7/5/6	32%	Maidstone 5 p.c.	..	56—61	
16,000	5	June 11	5	5%	Malta & Mediterranean	4½—4¾	1⅞—2⅛	..
150,000	100	Oct. 1	4½	4½%	Met. of Melbourne { 4½ p.c. Deb.	99—101	90—97	..
641,930	Stk.	Nov. 27	4	5%	Monte Video, Ltd.	11½—13	73—78	76
1,875,893	"	July 30	4½	3⅛%	Newcastle&Gateb'd Con.	98½—99½	69—70	..
599,795	..	June 27	8½	8½%	Do 8½ p.c. Deb.	86—88	57—58	..
15,000	10	Sept. 11	—	11%	North Middlesex 10 p.c.	..	183—183½	..
55,940	10	"	7/14/0	7/-	" 7 p.c.	14—15	9—9½	..
900,000	Stk	Nov. 27	8	8%	Oriental, Ltd.	117—129	102—105	..
60,000	5	Mar. 26	10	1/-	Ottoman, Ltd.	7½—7¾	4⅜—5½	..
60,000	50	Aug. 28	13	7½%	Portsea, Island B	128—131	60—65	62—62½
100,000	50	"	12	6⅜%	Do. C	118—121	54—57	..
949,980	5	April 29	5	—	Primitiva Ord.	5½—6	1½—2	35/—38/9
499,960	5	June 26	5	—	Do. 5 p.c. Pref.	4½—5	3—3½	65/-
621,600	100	Dec. 1	4	4%	Do. 4 p.c. Deb.	91—98	70—72	..
600,000	Stk.	July 30	4	4%	Do. " " 1911	..	49—52	51
848,198	"	June 27	4	4%	River Plate 4 p.c. Deb.	86—87	49—52	..
150,000	10	Sept. 26	6	6/-	San Paulo { 5 p.c. Pref.	10½—11	7½—8	..
125,000	50	July 2	5	5%	5 p.c. Deb.	44—49	40—42	..
185,000	Stk.	Aug. 28	10	8%	Sheffield A	288—294	75—80	..
209,984	"	"	10	8%	Do. B	222—234	75—80	..
528,500	"	"	10	4⅞%	Do. C	220—222	75—80	..
133,201	Stk.	Sept. 12	4	4%	Shrewsbury 5 p.c.	..	..	..
90,000	10	Oct. 15	9	10%	South African.	10½—11½	12—13	13
6,609,895	Stk.	Aug. 14	5/4/0	80/-	South Met. 4 p.c. Ord.	111—113	59—62	60—68⅞
250,000	"	July 11	—	5%	Do. Pref.	..	94—96	..
1,895,445	"	"	8	8%	Do. 8 p.c. Deb.	72½—74½	51- 54	..
294,890	"	Aug. 14	8½	5%	South Shields Con. Stk.	157—159	104—106	..
959,795	"	"	8	8⅓%	S'th Suburb'n Ord. 5 p.c.	114—116	68—78	70
187,558	Stk.	June 27	5	5%	Do. 5 p.c. Deb. Stk.	116—118	80—85	..
647,740	"	Nov. 13	7½	8⅓%	Southampton Ord.	99—102	61—63	..
121,275	"	June 27	4	4%	Do. 4 p.c. Deb. Stk.	..	63—65	..
130,000	"	Aug. 14		4⅛%	Tottenham { A 5 p.c.	185—188	70—75	..
782,275	"	"	6	8%	B 8½ p.c.	115—117	50—55	52—53½
181,255	"	Dec. 11	4	4%	District { 4 p.c. Deb.	87—89	63—65*	..
189,880	10	Dec. 30	5	—	Tuscan, Ltd.	5—6	1—2	..
149,900	10	July 1	5	5%	Do. 5 p.c. Deb. Red.	93—95	45—50	..
236,476	Stk.	Sept. 26	5	3⅛%	Tynemouth 5 p.c. max..	108½—109	74—76	..
					Wandsworth, Wimbledon, and Epsom—			
80,000	"	Aug. 28	8⅝	55/-	Wandsworth A 5 p.c..	151—156	85—90	..
255,686	"	"	6½	40/-	Do. B 8½ p.c.	129—134	63—68	..
108,075	"	"	—	38/6	Do: C	..	63—68	..
140,865	"	"	—	38/6	New Ordinary	..	63—68	..
359,000	"	"	8½	38/9	Wimbledon 5 p.c.	117—122	65—70	..
98,000	"	"	6½	40/-	Epsom 5 p.c.	121—126	65—70	..
88,416	"	June 27	5	5%	3 p.c. Deb. Stk.	48—49	49—51	

* Ex Div.

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Resists 4500° Fahr. Best for Gas-Works.
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TULLY'S PATENT.
CARBURETTED HYDROGEN PLANT
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COMPLETE GASIFICATION OF COAL.
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THE very best Patent Grids for Holding Oxide Lightly.
See Illustrated Advertisement Nov. 18, p. 400.

J. E. C. LORD, Ship Canal Tar-Works, Weaste, Manchester. Pitch, Creosote, Benzols, Toluol, Naphtha, Pyridine, all kinds of Cresylic Acid, Carbolic Acid, Sulphate of Ammonia, &c.

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EDINBURGH.
(See p. 624.)

TAR AND GAS LIQUOR WANTED
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Telephones: 815 Oldham, and 2412 Hop, London.
Telegrams—
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BAGLEY, MILLS, & CO., Ltd.,
92, Victoria Street, Westminster, S.W. 1, Invite inquiries from all Gas-Works making 75 million cubic feet and upwards per annum.

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SPECIALLY prepared for the manufacture of SULPHATE OF AMMONIA.
SPENCER CHAPMAN & MESSEL, LTD., with which is amalgamated WM. PEARCE & SONS, LTD., Mark Lane, LONDON, E.C. Works—SILVERTOWN.
Telegrams—"HYDROCHLORIC, FEN, LONDON."
Telephone—1588 AVENUE (8 lines).

APPOINTMENTS, &c., VACANT.

WHEN Filling Vacancies, please REMEMBER THE CLAIM OF THE EX-SERVICE MAN, who, other Qualifications being equal, has the FIRST CALL ON YOUR CONSIDERATION.

CLEETHORPES GAS COMPANY.

APPLICANTS for the Post as Rental CLERK to the Above Company are THANKED, and informed that THE POSITION HAS NOW BEEN FILLED.

TORQUAY GAS COMPANY.

APPLICANTS for the Post of Fore- MAN OF THE DISTRIBUTION DEPARTMENT to the Torquay Gas Company are THANKED and are Informed that a SELECTION HAS NOW BEEN MADE.

APPOINTMENT OF ENGINEER AND MANAGER.

THE Sleaford Gas Company, Ltd., invite Applications for the Appointment of an ENGINEER and MANAGER of the Company's Works as from the 31st of March, 1920.
Annual make, 40 Millions.
The Duties will include the Keeping of the whole of the Company's Books and Accounts, Control of the Works, Plant, Mains and Services, the Distribution over the District, and the General Duties of such a Position with the assistance of a Clerk and Collector.
Applications, stating Age and Experience of the Applicant, accompanied by *copies* of Three recent Testimonials, stating Salary required, to be sent to the undersigned, endorsed "Gas Engineer and Manager," by Saturday, the 20th of December next.
A good House, Garden, Coal, and Gas are found by the Company.
Canvassing not allowed.
H. WIMHURST,
Engineer and Manager.
Gas-Works, Sleaford,
Dec. 6, 1919.

BOROUGH OF STOCKTON-ON-TEES.

APPOINTMENT OF GAS ENGINEER AND MANAGER.

THE Corporation of Stockton-on- Tees invite Applications for the Position of GAS ENGINEER and MANAGER. The Salary will be £750 per Annum. The person appointed will be required to Devote the Whole of his Time to his Duties and will not be allowed to engage in Private Practice.
Canvassing, either directly or indirectly, will be regarded as a Disqualification.
Applications, stating Age, Qualifications, and Experience, accompanied by *copies* of not more than three recent Testimonials and endorsed "Gas Engineer," to be sent to the undersigned not later than Twelve o'clock noon on Saturday, the 27th of December, 1919.
THOS. DOWNEY,
Town Clerk.

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BALE & CHURCH, LTD.
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Phone: Avenue 6680.

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SPENT OXIDE BOUGHT.

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(W. T. P. CUNNINGHAM, Chief Proprietor and Managing Director.)
13, ARCADIAN GARDENS, WOOD GREEN, LONDON, N. 22.
Telegrams: "Bripurimat, Wood, London"
'Phone: Palmer's Green 608.

KESWICK GAS COMPANY.

THE above Company require the Ser- vices of a WORKING MANAGER with practical Experience in Carbonizing and the Routine of a small Gas-Works. He must be a practical Fitter, competent to Lay Mains and Services and to Fix Meters and Cookers.
The annual make of Gas is about 23,000,000 c.ft.
Applications, stating Age, Experience, and Salary required, and accompanied by *copies* of not more than Three recent Testimonials, to be Delivered at my Office not later than the first post on Wednesday, the 17th inst.
J. H. BRODIE,
Secretary.
Otley Road, Keswick,
Cumberland,
Dec. 4, 1919.

COUNTY BOROUGH OF STOCKPORT.

(GAS DEPARTMENT.)

THE Gas Committee invite Applica- tions for a DISTRIBUTION SUPERINTENDENT to Take Entire Charge and Supervision, under the Gas Engineer, of their Distribution Department.
Applicants must be Experienced in Mains and Service Laying, Public Lighting, and thoroughly acquainted with Modern Gas Appliances and their Application and Use.
Commencing Salary, £300 per Annum. No War Bonus.
Applications, stating Age and Experience, accompanied by not more than Three recent Testimonials, endorsed "Distribution Superintendent," to be addressed to the Chairman of the Gas Committee, Town Hall, Stockport, not later than Saturday, the 20th of December, 1919.
ROBERT HYDE,
Town Clerk.

THE Portsea Island Gas Light Com- pany require a SUPERINTENDENT for their Flat-house Gas-Works, Portsmouth. Applicants must have had an Engineering Training and possess a Thorough Knowledge of Stoking and Electrical Machinery, Vertical Retorts, and Water-Gas Plants.
Salary, inclusive of War Bonus, £325 per Annum with free House.
Applications, stating Age, full Particulars of Experience and Qualifications, and enclosing *Copies* of two recent Testimonials, to be Delivered to the undersigned not later than the 3rd of January, 1920.
T. CARMICHAEL.
Gas Offices,
Town Hall Square,
Portsmouth.

WANTED, a Man of Education, pos- sessing Energy, Enthusiasm, and Common Sense, to REPRESENT a LARGE GAS-STOVE Firm in Lancashire and Yorkshire. Only a First-Class Man considered.
Write, stating Age and Experience, to No. 6814, care of Mr. KING, 11, Bolt Court, FLEET STREET, E.C. 4.

DRAUGHTSMAN Wanted by Pro- vincial Gas Company, with wide Experience in Structural Engineering and Design of Buildings and Plant for Gas-Works. Salary, £300 per Annum.
Apply, stating Age, Training, and Qualifications, also Works Experience, to No. 6810, care of Mr. KING, 11, Bolt Court, FLEET STREET, E.C. 4.

WANTED.—Experienced Man capable of undertaking the INSPECTION of WATER FITTINGS on Consumers' Premises, and also WASTE DETECTION in Underground Mains for Water and Gas.
Apply, stating Age, Experience, and Wages required, to the ENGINEER, Gas and Water Works, DEVIZES.